Comparison
of
Digital Asset Management Systems
(work area E)

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1. Introduction

This document includes examination of various digital asset management systems (DAMS) capabilities and functions. Evaluation is based on the documentation relating to each package.

The objectives of this evaluation process are:
- To gain understanding of the design, architecture and implementation details of DAMS.
- To evaluate DAMS against set of criteria.
- To recommend the most suitable candidate DAMS for deployment by the THDI partners.

2. Evaluation Methodology

The list of DAMS for evaluation includes:
- CONTENTdm
- PastPerfect Museum Software
- Greenstone Digital Library Software
- DSpace
- Fedora
- Hyperion
- MetaSource
- Curator
- EMuseum
- MIMSY XG
- iO Willoughby
- Streetprints

The criteria for creation of a grid used for the evaluation of the functionality were:
- Target Organizations
- Collection Items, Media Types and Formats
- Collection Size and Search Efficiency
- Scalability
- Interfaces and Web Compatibility
- Interoperability
- Metadata Formats
- Security and Authentication
- System Requirement
- Implementation Requirements and Technical Support
- Pricing and Licensing

Each evaluation criterion is given an importance rating or weight from 1 to 3 to be used when evaluating various DAMS. Each DAMS was then rated by each criterion using a range of 1-5, where:
1 – Failed or feature does not exist.
2 – Has poor support and/or it can be done but with significant effort.
3 – Fair support but needs modification to reach the desired level of support.
4 – Good support and needs a minimal amount of effort.
5 – Excellent support and meets the criteria out of the box, minimal effort.

The list of criteria and importance ratings assignments take into account recommendations given in the document *Texas Heritage Digitization Initiative Standards and Best Practices*.

This document suggests that in general, open standards are to be preferred over proprietary standards, as this may reduce the need for re-digitization in the future. This recommendation is taken into account by giving the highest grade to the open source DAMS by the Pricing and Licensing criterion.

The document specifies three levels of metadata: minimal, basic, and enhanced. DAMS are rated respectively by the Metadata criterion.

Texas Heritage Digitization Initiative Standards and Best Practices document also identifies three levels of interoperability: minimal, basic, and enhanced. This aspect is especially important because to promote the best use of the repositories, and particularly to enable access to them through a single search interface, it will be necessary for THDI partner institutions to meet particular interoperability requirements and standards. DAMS are rated by Interoperability criterion taking into account these recommendations.

In some cases existing documentation and other available sources do not contain any information about functionality features related to specific criteria. In these cases corresponding sections mention that no information available and DAMS is rated 1 by this criteria, assuming the feature is not supported.

Evaluation grid and summary are presented in the last section of this document. Three DAMS are identified to process to installation and testing.

3. CONTENTdm

3.1. Overview
CONTENTdm is powerful and flexible digital collection management package. It provides tools for everything from organizing and managing to publishing and searching digital collections over the Internet.

CONTENTdm consists of three main elements:
- The Acquisition Station where data and images are imported or added
- The CONTENTdm Server where data and images are stored
- The customizable Web-based search client

Acquisition Station software can be installed on as many as 50 different workstations for collaborative work or collections can be managed remotely over the Web. Items can be added to CONTENTdm singly or in batches. The database is searched over the Web using standard Web browsers by any number of users unless this number is restricted.

3.2. Developer
DiMeMa Inc. (Digital Media Management)

3.3. Target Organizations
Universities, libraries, museums, commercial and government entities, and nonprofit organizations, historical societies, etc.

3.4. Collection Items, Media Types and Formats
CONTENTdm can store virtually any media types; examples: audio and video files, images, documents, two-sided objects, six-sided objects. Any items can be stored; examples: newspapers, maps, photographs, yearbooks, transcribed diaries, rare books, oral histories, audio and video clips, poster art, etc.

3.5. Collection Size and Search Efficiency
The maximum number of items in a single collection is 16 million. Search in a collection of several million objects is performed for less than one second.

3.6. Scalability
Software is scalable from small libraries to large universities and multinational commercial organizations, it supports geographically distributed collections. Multi-Site Server is available for cross collection searching on multiple servers. Independent online collections of multiple organizations can be simultaneously searched and viewed through one seamless CONTENTdm Web interface. Customers

who subscribe to our Annual Maintenance Agreement can develop collections incrementally with CONTENTdm without re-installing the software.

3.7. Interfaces and Web Compatibility

Collections are accessible to end users through standard Web browsers. 100% web compatible.

3.8. Interoperability

CONTENTdm is intended to provide the digital media management module within the context of other installed systems. A host of input options are provided to leverage existing collection formats and the search results from CONTENTdm may be imported to other programs.

CONTENTdm is Z39.50 compatible through a free open source software product called ZCONTENT developed by the University of Utah Marriott Library. ZCONTENT can be downloaded for free from the CONTENTdm User Support Center. ZContent will process incoming Z39.50 requests, convert them to appropriate CONTENTdm requests, and return the results in either USMARC or XML format.

CONTENTdm Servers support OAI harvesting by functioning as OAI repositories.

Collections can be automatically added to OCLC WorldCat. Descriptive metadata is added to WorldCat but collection owners retain complete control since individual items are served from your local server.

XML is used for all internal structure description. CONTENTdm also offers custom XML export of metadata that supports user-defined fields and formats for greater compatibility with local catalog systems and other applications.

Import of metadata into CONTENTdm from existing tools such as Access, Excel, and FileMaker Pro is provided.

3.9. Metadata Formats

Two metadata schemas are used: Dublin Core and the Visual Resource Association Core. Collection Administrators can still apply their own field descriptions and map back to either standard to provide flexible searching to end users.

The maximum number of metadata fields a user can create is 100. The maximum number of characters supported in a single metadata field is 128,000. Metadata templates can be crated to speed and standardize the entry of descriptive and administrative metadata. It is possible to make global changes to metadata within live collections. Controlled vocabulary is available for consistent, uniform metadata entry.

International characters are supported (Latin-1).

3.10. Security and Authentication

Images can be protected by restricting access to them using CONTENTdm's security features. CONTENTdm supports both collection and item-level security. Access to items and collections can be restricted based on operating system user names or IP addresses. Additionally, CONTENTdm's Image Rights options allow to band, brand, or watermark images with copyright information or a logo.

3.11. System Requirement

The CONTENTdm Server requires the following:
- Microsoft® Windows ServerTM 2000 or 2003, Linux, or SunTM SolarisTM 8 or higher
- Dedicated Web server (IIS 4.0 or later with Windows®, Apache with UNIX)
- 32-bit x86 processor (Intel® Pentium® 4 class compatible processor or higher)
- Minimum 512MB RAM. Recommended 1GB+ RAM
- Adequate disk space to hold your collection.

The CONTENTdm Acquisition Station requires the following:
- Microsoft Windows 2000 Professional or Windows XP
- Intel Pentium 4 processor

- Microsoft Internet Explorer 6.0 or later
- Minimum 256MB RAM
- 100MB of available hard-disk space for installation
- Minimum display resolution of 1024 x 768
- 128Kbps or faster connection
- Acrobat® Reader® 5.0 or Adobe® Reader 6.0 or later

3.12. Implementation Requirements and Technical Support

CONTENTdm is easy to implement, learn, and use. Ample online help and tutorials are provided to accelerate training.

Annual Maintenance Agreement (first year fee included in the CONTENTdm purchase price) covers:
- Access to Web-based Help, Tutorials, and Installation and Administration files.
- Technical phone and e-mail support from professionals.
- Prompt response to all support inquiries.
- Upgrades to the current version of CONTENTdm.

Onsite training is available.

3.13. Pricing and Licensing

Free 60-day evaluation is available in two versions: hosted or full (one copy per organization)

Level	Collection size	Price	Annual Maintenance Agreement fee
Level 1	max 10,000 stored images	$9,800	$1,666
Level 2 (includes JPEG2000 Extension and 2 JPEG2000 and 2 OCR Acquisition Stations)	max 50,000 stored images	$19,800	$3,366
Unlimited for single organization (includes JPEG2000 Extension and 4 JPEG2000 and 4 OCR Acquisition Stations)	unlimited	$49,800	$8,466

3.14. References

CONTENTdm Digital Collection Management Software (DiMeMa, Inc.):
<http://www.dimema.com/index.html>

4. PastPerfect Museum Software

4.1. Overview

PastPerfect is affordable, flexible and easy to use collection management software for both small organizations and large collections.

PastPerfect conforms to the latest standards for cataloging archive, library, historic object, art object, natural history, archaeology, and photograph collections. It encompasses every aspect of collection and membership management. Automate accessions, cataloging, loans in, loans out, exhibits, condition reporting, and repatriation.

Greenstone interface, and all documentation, is available in English, French, Spanish, Russian and Kazakh.

4.2. Developer

Pastime Software Company, Inc.

4.3. Target Organizations

Museums, archives, historical societies.

4.4. Collection Items, Media Types and Formats

Catalog archives, art, archaeology, geology, historic objects, library materials, music collections, natural history, oral histories, and photographs.

Up to 999 images per catalog record can be attached. Audio, video, Excel, PDF, documents and web links to catalog records can be attached.

4.5. Collection Size and Search Efficiency

Catalog up to one million catalog records.

4.6. Scalability

No information

4.7. Interfaces and Web Compatibility

It uses local client interface. Not web compatible.

4.8. Interoperability

Import from FoxPro, D-Base, ASCII, MS-Excel. Export to FoxPro, D-Base, ASCII, MS-Excel, and XML.

4.9. Metadata Formats

Fields conform to international standard ISAD(G). Software provides view of Dublin Core elements in XML from catalog screens is provided and web link to Getty Art & Architecture Thesaurus or Library of Congress from catalog screens. Software includes over 100 verified authority files for major fields.

4.10. Security and Security and Authentication

Software provides Password Protection System that restricts selected users form sensitive data.

4.11. System Requirement

Minimum Hardware:
1 GHz Processor
256 MB RAM (512 MB if using Windows XP)
17" Color Monitor 1024 x 768 resolution
Laser or Inkjet Printer
CD-ROM Drive
Mouse
Windows ME, 2000, XP, Server 2003

Hard Drive Free Space:
Program 140 MB
Data 12 MB per 1000 records
Images 200 MB per 1000 images

Imaging Hardware Requirements:
TWAIN compatible Digital Scanner or Digital Camera
CD or DVD Burner (for Backup)

Network Hardware Requirements:
Network Neighborhood (included with Windows ME and XP)
Network throughput of 100MPS

4.12. Implementation Requirements and Technical Support

The PastPerfect support staff includes both computer and museum professionals.

PastPerfect comes with 30 days of free warranty support. After the first 30 days, annual support plans are available starting at under $240. A support contract gives users unlimited access to the technical staff for a single yearly fee.

Support is available via by email is available via email or voice-mail which is active 24 hrs a day and calls are responded in the order they are received. Callas are usually returned within the hour. User's guides are available in PDF format.

Discussion forum is available.

4.13. Pricing and Licensing

FREE trial software is available. This software is identical to the regular software, except that it is limited to the entry of 200 catalog records.

Price List	Standard Price	AASLH Organizational Members
PastPerfect Basic Program Version 4.0	$795.00	$636.00
PastPerfect Upgrade to Version 4.0	$310.00	$248.00
Add-on Options		
Multi-media	$370.00	$296.00
Virtual Exhibit	$375.00	$300.00
Barcode Printing	$79.00	$63.20
Scatter/Gather	$99.00	$79.20
ezMARC	$95.00	$76.00
Network Upgrade 2 to 5 users	$450.00	$360.00
Services		
First Year Support Single User	$299.00	$239.20
First Year Support Network Users	$372.00	$297.60
Training classes	$119.00	$95.20
PastPerfect-Online (Software and Hosting)		
PastPerfect-Online Software	$248	$199
PastPerfect-Online Hosting Startup package for 10,000 records	$410	$329
PastPerfect-Online Hosting Each Additional 10,000 records	$236	$189

4.14. References

PastPerfect Museum Software (Pastime Software Company, Inc.): <http://www.museumsoftware.com/>

5. Greenstone Digital Library Software

5.1. Overview

Greenstone is a suite of software for building and distributing digital library collections. It provides a new way of organizing information and publishing it on the Internet or on CD-ROM. The aim of the Greenstone software is to empower users to build their own digital libraries, to encourage the effective deployment of digital libraries to share information and place it in the public domain.

5.2. Developer

New Zealand Digital Library Project at the University of Waikato. Software developed and distributed in cooperation with UNESCO and the Human Info NGO. It is open-source, multilingual software, issued under the terms of the GNU General Public License.

5.3. Target Organizations

Universities, libraries, and other public service institutions.

5.4. Collection Items, Media Types and Formats

Plug-ins are used to ingest documents. For textual documents, there are plug-ins for
- PDF, PostScript, Word, RTF, HTML, Plain text, Latex, ZIP archives, Excel, PPT, Email (various formats), source code

For multimedia documents, there are plug-ins for
- Images (any format, including GIF, JIF, JPEG, TIFF), MP3 audio, Ogg Vorbis audio, and a generic plug-in that can be configured for audio formats, MPEG, MIDI, etc.

5.5. Collection Size

There is a Huffman coding limitation that limits collections to 16 Gb.

5.6. Scalability

No information

5.7. Interfaces and Web Compatibility

Greenstone has two separate interactive interfaces, the Reader interface and the Librarian interface. End users access the digital library through the Reader interface, which operates within a web browser. The Librarian interface is a Java-based graphical user interface (also available as an applet) that makes it easy to gather material for a collection (downloading it from the web where necessary), enrich it by adding metadata, design the searching and browsing facilities that the collection will offer the user, and build and serve the collection.

5.8. Interoperability

Greenstone is highly interoperable using contemporary standards. It incorporates a server that can serve any collection over the Open Archives Protocol for Metadata Harvesting (OAI-PMH), and Greenstone can harvest documents over OAI-PMH and include them in a collection. Any collection can be exported to METS (in the Greenstone METS Profile, approved by the METS Editorial Board and published at http://www.loc.gov/standards/mets/mets-profiles.html), and Greenstone can ingest documents in METS form. Any collection can be exported to DSpace ready for DSpace's batch import program, and any DSpace collection can be imported into Greenstone.

5.9. Metadata Formats

Users define metadata interactively within the Librarian interface. These metadata sets are predefined:
- Dublin Core (qualified and unqualified)
- RFC 1807
- NZGLS (New Zealand Government Locator Service)
- AGLS (Australian Government Locator Service)

New metadata sets can be defined using Greenstone's Metadata Set Editor. "Plug-ins" are used to ingest externally-prepared metadata in different forms, and plug-ins exist for
- XML, MARC, CDS/ISIS, ProCite, BibTex, Refer, OAI, DSpace, METS

5.10. Security and Security and Authentication

No internal patron identification.

5.11. System Requirement

Greenstone runs on all versions of Windows, and Unix, and Mac OS-X. Both source code and binaries are available for download.

5.12. Implementation Requirements and Technical Support

Greenstone is very easy to install. For the default Windows installation absolutely no configuration is necessary, and end users routinely install Greenstone on their personal laptops or workstations.

Institutional users run it on their main web server, where it interoperates with standard web server software (e.g. Apache).

Greenstone is fully documented in English, French, Spanish and Russian (there are several manuals and guides that come with Greenstone). Greenstone Wiki hosts additional documentation. There are two mailing lists intended primarily for discussions about the Greenstone digital library software. Web based support form allows to send a query to the Greenstone support team. A variety of organizations run Greenstone training courses.

Commercial support for all Greenstone applications, including customized collection building, is provided by DL Consulting, Hamilton, New Zealand.

5.13. Pricing and Licensing

Greenstone is open-source software, distributed under the terms of the GNU General Public License.

5.14. References

Greenstone Digital Library Software (New Zealand Digital Library Project): <http://www.greenstone.org/>

6. DSpace

6.1. Overview

DSpace is an open source software package which provides the tools for management of digital assets, and is commonly used as the basis for an institutional repository. It is also intended as a platform for Digital preservation activities.

DSpace integrates a user community orientation into the system's structure. This design supports the participation of the schools, departments, research centers, and other units typical of a large research institution. As the requirements of these communities might vary, DSpace allows the workflow and other policy related aspects of the system to be customized to serve the content, authorization, and intellectual property issues of each. Supporting this type of distributed content administration, coupled with integrated tools to support digital preservation planning, makes DSpace well suited to the realities of managing a repository in a large institutional setting in terms of its feature-set. DSpace is also focused on the problem of long-term preservation of deposited research material.

6.2. Developer

Jointly developed by MIT Libraries and Hewlett-Packard Labs.

6.3. Target Organizations

It has been installed and is in production at over 100 institutions around the globe, from large universities to small higher education colleges and research centers.

6.4. Collection Items, Media Types and Formats

Research institutions worldwide use DSpace to meet a variety of digital archiving needs:
- Institutional Repositories (IRs)
- Learning Object Repositories (LORs)
- eTheses
- Electronic Records Management (ERM)
- Digital Preservation
- Publishing

DSpace accepts all forms of digital materials including text, images, video, and audio files. Possible content includes the following:
- Articles and preprints
- Technical reports

- Working papers
- Conference papers
- E-theses
- Datasets: statistical, geospatial, matlab, etc.
- Images: visual, scientific, etc.
- Audio files
- Video files
- Learning objects
- Reformatted digital library collections

6.5. Collection Size and Search Efficiency

No information

6.6. Scalability

DSpace has well documented scalability issues. The DSpace project team themselves are not addressing the scalability problem, and the code base is not easy to re-architect.

DSpace scalability issues report can be viewed at:
http://wiki.DSpace.org/ScalabilityIssues

6.7. Interfaces and Web Compatibility

DSpace has a clean web-based user interface and is relatively simple for a non-experienced user. Configuration of the UI would need to be done by a developer. It uses JSP for its presentation layer and customization is documented here: http://DSpace.org/technology/system-docs/configure.html#customui

6.8. Interoperability

It makes its holdings available primarily via a web interface, but it also supports the OAI-PMH v2.0, and is capable of exporting METS (Metadata Encoding and Transmission Standard) packages also. It also has support for both REST and SOAP web services. DSpace supports SRU/SRW. DSpace supports LDAP Security and Authentication as described here:
http://www.DSpace.org/technology/systemdocs/configure.html#ldap

6.9. Metadata Formats

Broadly speaking, DSpace holds three sorts of metadata about archived content:

Descriptive Metadata. Each Item has one qualified Dublin Core metadata record. DSpace currently uses a qualified version of the Dublin Core schema based on the Dublin Core Libraries Working Group Application Profile (LAP). DSpace uses the LAP as a starting point for its application of Dublin Core, borrowing most of the qualifiers from it and adapting others to fit. Some qualifiers were also added to suit DSpace needs.

Administrative Metadata. This includes preservation metadata, provenance and authorization policy data.

Structural Metadata. This includes information about how to present an item, or bitstreams within an item, to an end-user, and the relationships between constituent parts of the item.

6.10. Security and Authentication

DSpace supports SSL and does practice good server side security for it to get installed. There is a configurable infrastructure for Security and Authentication in DSpace that currently supports web UI or LDAP Security and Authentication. DSpace supports different groups and roles. A web UI also allows you to edit the permission and policies.

6.11. System Requirement

DSpace will function on a modest PC installation. There are no exact minimum specifications; it just needs to be able to run PostgreSQL/Oracle and a java servlet.
DSpace requires the following software:
- Unix like OS
- Java 1.4 or higher
- Apache Ant 1.5 or higher
- PostgreSQL 7.3 or higher / Oracle 9i or higher
- Jakarta Tomcat 4.x or higher, or something equivalent
More details can be seen here: http://DSpace.org/technology/system-docs/install.html

6.12. Implementation Requirements and Technical Support

The community is serviced technologically by a development base at SourceForge, and a number of mailing lists for technical queries and development discussion, as well as a general list for non-technical community members.

6.13. Pricing and Licensing

The DSpace open source platform is freely available, customizable and extendible. It is shared under a BSD license.

6.14. References

DSpace digital repository system (DSpace Federation) <http://dspace.org/>

Technical Evaluation of selected Open Source Repository Solutions (Open Access Repositories in New Zealand) <https://eduforge.org/docman/view.php/131/1062/Repository%20Evaluation%20Document.pdf>

7. Fedora

7.1. Overview

Fedora is a general purpose repository system. The Fedora Project is devoted to the goal of providing open-source repository software and related services to serve as the foundation for many types of information management systems. The Fedora Project is based on previous research at Cornell University Computer Science that was funded by DARPA and the National Science Foundation. The Fedora Project is currently supported by generous grants from the Andrew W. Mellon Foundation.

7.2. Developer

Developed jointly by Cornell University Information Science and the University of Virginia Library.

7.3. Target Organizations

Some examples of applications that are built upon Fedora include library collections management, multimedia authoring systems, archival repositories, institutional repositories, and digital libraries for education.

Fedora can be used for Digital preservation, Institutional repositories, Commercial content systems, Electronic records, Multimedia web sites, Digital library collections, Distributed digital libraries.

7.4. Collection Items, Media Types and Formats

Complex multi-media content that combines text, images, audio, and video.

Fedora provides expressive inter-object relationships: digital objects contain metadata that can express any type of relationships such as membership in collections, structural associations like articles in journals or pictures in albums, or taxonomic relationships. Relationship metadata is indexed and can be searched using semantic web query languages.

7.5. Collection Size and Search Efficiency

The current version of the software provides a repository that can handle one million objects efficiently.

7.6. Scalability

Fedora scales well with the test 100,000 digital objects and it has been tested to scale up to 1 million digital objects the Fedora community is targeting to test storage and retrieval of 20 million to 30 million objects.

7.7. Interfaces and Web Compatibility

The system's interface comprises three web based services:
- A management API that defines an interface for administering the repository, including operations necessary for clients to create and maintain digital objects;
- An access API that facilitates the discovery and dissemination of objects in the repository;
- A streamlined version of the access system implemented as an HTTP-enabled web service.

Since Fedora is a web service and does not have a web UI front end, many UI applications have been built to front-end Fedora.

7.8. Interoperability

Fedora, being a web service itself rather than a web application, naturally supports SOAP and REST web services. Fedora supports OAI-PMH, METS and Dublin core. It also has import and export scripts and supports FOXML and METS formats. Fedora supports Security and Authentication through LDAP.

7.9. Metadata Formats

Fedora provides extensible metadata management capabilities: because metadata and data are treated uniformly in the digital object model, any number and variety of metadata formats may be stored as data streams, alongside content, in a digital object.

7.10. Security and Authentication

All functions of Fedora, both at the object and repository level, are exposed as web services. These functions can be protected with fine-grained access control policies. Fedora supports SSL. It requires a data directory that is not accessible from the outside and can be secured pretty well.

7.11. System Requirement

Fedora does not require a lot of different software components, as the packaging includes all required software. It only needs the installation of a database if its internal database is not used. Fedora requires Sun Java SDK 1.4.2 or above.

7.12. Implementation Requirements and Technical Support

Fedora supports repositories that range in complexity from simple implementations that use the web service's "out of the box" defaults to highly customized and full featured distributed digital repositories.

Fedora's documentation is of good quality. Its documentation can be found here:
http://www.fedora.info/documentation/

A wiki, mailing list, and bug tracker is provided for the public.

7.13. Pricing and Licensing

Open-source software, available under the terms of the Educational Community License 1.0 (ECL).

7.14. References

Fedora (Cornell University Information Science and the University of Virginia Library)
<http://www.fedora.info>

Technical Evaluation of selected Open Source Repository Solutions (Open Access Repositories in New Zealand) <https://eduforge.org/docman/view.php/131/1062/Repository%20Evaluation%20Document.pdf>

8. Hyperion

8.1. Overview

The Hyperion Digital Media Archive is a tool for building, storing, and maintaining collections of digitally captured material - most often scanned documents, photographs, maps, drawings, artwork, sound and movie clips. Hyperion can also serve as a repository for computer-generated material such as technical documents, multimedia presentations, and engineering drawings.

8.2. Developer

SirsiDynix was created in June 2005 through the merger of Dynix Corporation with Sirsi Corporation. Both companies are information technology providers to libraries and consortia worldwide.

8.3. Target Organizations

All types of libraries.

8.4. Collection Items, Media Types and Formats

Hyperion is designed for both digitized media and intelligent documents that are of a published nature. Hyperion can store scanned documents, photographs, maps, drawings, artwork, sound and movie clips, technical documents, multimedia presentations, engineering drawings, etc.

Multi-page documents are supported, in both a single file format or as a collection of single page image files. Supported file formats include TIFF, JPEG, GIF, PCX, BMP, CALS, PDA, RLE, and others.

8.5. Collection Size and Search Efficiency

Hyperion is ideal for both large and small collections of material.

8.6. Scalability

Hyperion is available in configurations and capacities that can expand with the growth of collections.

8.7. Interfaces and Web Compatibility

Hyperion supports two user interfaces, a Graphical User Interface (GUI) for PCs and an interface for World Wide Web browsers.

8.8. Interoperability

The Import Manager enables system administrators to batch-load large volumes of files into the Hyperion file system or other file systems, while automatically indexing, attributing, and linking these files to appropriate citation records by following specific scripts developed by the site.

8.9. Metadata Formats

When files are added to Hyperion, metadata is also added. Field information such as the document's title, subject, author, published date, file size, scan resolution, or other configurable sets of metadata are often used to better organize the archive.

Supports Dublin Core metadata format.

8.10. Security and Authentication

Hyperion follows the security and access control definitions defined by the customer in the patron records. By default, the defined user access levels (e.g., Administrative, Staff, Public, etc.) will be used to control access to the various system commands and functions. These can also be applied by the library to the media archive files as a means of specifying user access privileges to portions r all of the archived material.

8.11. System Requirement

Larger customers with potentially hundreds or thousands of users will often opt to purchase a dedicated server for Hyperion. Otherwise it can be installed on the same server with

8.12. Implementation Requirements and Technical Support

Administration needs of Hyperion are modest and occasional.

8.13. Pricing and Licensing

Hyperion has a model-based pricing scheme. The cost of Hyperion is related to how many documents are needed to manage within Hyperion, and which Hyperion modules are required by particular environment. A SirsiDynix Marketing Representative can quote pricing configurations.

8.14. References

SirsiDynix : Solutions : Digital Archive (SirsiDynix)
<http://www.sirsidynix.com/Solutions/Products/digitalarchive.php>

9. MetaSource

9.1. Overview

Innovative's MetaSource is a suite of tools that allows libraries to effectively manage their digital collections. This includes digital object storage, crawling external collections, and full support for metadata schemes such as Dublin Core.

MetaSource is made up of three components: Millennium Media Management, XML Harvester, and Metadata Builder.

It also includes a Copyright and Access component to handle the complex licensing and copyright issues of digital collections. The XML Harvester gathers XML records from any server; it then parses and creates records on the Innovative system. Metadata Builder stores XML in the metadata scheme of choice. Together, these tools create a comprehensive digital library management strategy.

Millennium Media Management
Millennium Media supports the creation of a local media collection.
Features of Millennium Media Management include:
- Java-based media client that enables importing, linking, and scanning of digital objects
- Local Media Storage
- Multi-page image set support
- Support for scanning with TWAIN compliant devices and ADF (Automatic Document Feeder)
- Thumbnail association with any media set
- Image viewer for JPEG and TIFF files enabling image manipulation, printing, and saving
- Text–file association with media objects for document indexing and retrieval

XML Harvester
Innovative's XML Harvester leverages XML technology to provide an automated cataloging tool which can create library records from metadata records stored on servers anywhere in the world. The XML Harvester unifies access to different XML databases by integrating external records into the library catalog and making it a single repository for the library's different digital collections.
Features of XML Harvester include:
- A crawler that can harvest XML records from any server according to library-defined filters
- A parser that creates MARC records from XML documents encoded in schemes such as EAD or Dublin Core
- Library-defined parameters such as sorting and frequency of loading
- Compliant with OAI (Open Archives Initiative)

9.2. Developer

Innovative Interfaces, Inc.

9.3. Target Organizations

Libraries of all sizes and types.

9.4. Collection Items, Media Types and Formats

Archival material, photographs, newspaper clippings, electronic reserve material, lecture notes, or audio files. Millennium Media Management creates and stores media objects such as images, sound files, and audio files. Filetypes supported: JPEG, TIFF, BMP, PNG, PDF, DOC, PPT, AVI, and more.

9.5. Collection Size and Search Efficiency

Multi-tiered client-server architecture provides clean, standardized interfaces based on an extensible, component-based model. This facilitates the handling of high-volume transactions for maximum flexibility.

9.6. Scalability

From small special libraries to the largest consortia.

9.7. Interfaces and Web Compatibility

The digital collection can be stored in the library's format of choice and is fully integrated into the Web OPAC for searching and viewing. Metadata Builder provides web-based display appropriate to both object- and collection-level metadata

9.8. Interoperability

Millennium Media Management can be fully integrated with the main bibliographic database or with a separate reference database. Metadata Builder allows to enter, batch load, store, and export XML in a defined metadata scheme

9.9. Metadata Formats

Metadata Builder allows libraries to describe and store digital collections using a variety of metadata schemes such as Dublin Core or EAD.
Features of Metadata Builder include:
- Support for the storage of metadata structures and formats (e.g., EAD, TEI, Dublin Core, and XML)
- Indexing and retrieval on the various metadata schemes
- Links digital objects with appropriate metadata (e.g., image database with Dublin Core or digital archives with EAD)

9.10. Security and Authentication

Copyright and Access, in conjunction with Millennium Media, is used to provide controlled access to digital collections and provides:
- Copyright statement and tracking
- Patron authentication for viewing digital objects on an object-by-object basis
- Statistical reports on use of resources and publisher and copyright tracking

Millennium Media Management also provides a robust and feature rich Electronic Course Reserves module. Media can be associated with course records and copyright, and patron authentication provides the tools libraries need for full electronic course reserve management.

9.11. System Requirement

MetaSource is platform-independent. Libraries have a choice of which hardware and operating systems can be intermixed.

9.12. Implementation Requirements and Technical Support

Innovative offers personal customer support—24/7 by telephone and Web.

9.13. Pricing and Licensing

Typically licensed for a fixed number of staff users, based on the needs of the library, and an unlimited number of public users.

9.14. References

Innovative Interfaces: Millennium: Digital Collections (Innovative Interfaces)
<http://www.iii.com/mill/digital.shtml>

Innovative Interfaces: Literature: Product Brochures (Innovative Interfaces)
<http://www.iii.com/lit/brochures.shtml>

10. Curator

Ex Libris and Endeavor merged in December 2006 (Endeavor became part of Ex Libris). Curator is no longer listed under the products at the Ex Libris web site.

11. EMuseum

11.1. Overview

eMuseum is a web-based software program that integrates seamlessly with The Museum System (TMS) and other collection management systems to dynamically publish information to a website, Intranet, and kiosks.

eMuseum helps to:
- Engage visitors with tools for creating personal groupings of favorite works
- Educate your community with online exhibitions and detailed information about works
- Entertain your audience through multi-media representations of works in collection

eMuseum comes with a standard set of display templates that can be customized to match the look and feel of the website. The program takes a "snapshot" of records from the collection management system and publishes it online. Additionally, eMuseum's simple, yet powerful "refresh" capability makes sure your published data remains up-to-date.

eMuseum uses web standards such as CSS, HTML, and XSL to ensure easy customization and forward compatibility.

11.2. Developer

Gallery Systems

11.3. Target Organizations

Cultural institutions, museums, government agencies, private and corporate collectors.

11.4. Collection Items, Media Types and Formats

All types of collections, from fine arts and archives to paleontology and ethnology. Digital files (still or moving images, web pages, word processing documents, etc.)

11.5. Collection Size and Search Efficiency

No information

11.6. Scalability

eMuseum posts more than just collection information to the web; it can post content from multiple systems and channels. eMuseum can be configured to draw information directly from external resources, such as library or archives data.

11.7. Interfaces and Web Compatibility

eMuseum is designed to be accessed via a web browser (such as Internet Explorer or Firefox). No additional client software is required to use eMuseum. The minimum recommended browser versions are Internet Explorer 6 and Firefox 1.x.

11.8. Interoperability

eMuseum also uses an open database structure that allows unlimited possibilities of data organization and integration.

11.9. Metadata Formats

Object record web pages display biographical information about the object's maker, in addition to thumbnail images of related objects and archives. Visitors can also view the exhibition history of a particular object.

11.10. Security and Authentication

eMuseum allows assigning secure levels of access to the Intranet by staff-member role: curator, director, registrar, and rights manager among others.

11.11. System Requirement

Database Software and Server Operating System
eMuseum is a database-independent application and will operate with any ODBC or OLE DB, SQL-92 compliant database management system.

eMuseum functions with the following database management systems:
- Microsoft SQL Server (version 7.0 or higher)
- Oracle RDBMS (version 8.17 or higher)
- MySQL
- Sybase SQL Anywhere/ASA

To support retrieval of data or searching using Unicode characters, both Microsoft Windows 2000 or 2003 Server and Microsoft SQL Server 2000 are required.

Web Server Conguration
The required web server configuration is:
- Windows 2000 or Windows 2003 Server with latest service pack
- Microsoft Internet Information Server 5.1 (or later)
- Microsoft Transaction Server
- Microsoft Data Access Components v2.7
- Microsoft XML Parser v 4.0 (or higher)
- Microsoft Internet Explorer v5.5 (or higher)
- Network Card
- Hard disk storage capacity su-cient for anticipated volume of images
- Dedicated Internet connection is recommended (for access by Internet users)

11.12. Implementation Requirements and Technical Support

eMuseum lets publish collection to the web in a matter of hours. Because eMuseum works dynamically with the collection management system, it eliminates the need for costly, repeated extractions of data.

Technical Support: online support form

11.13. Pricing and Licensing

Depends of many factors, like size of collection, number of users, etc.

Gallery Systems offers three levels of eMuseum licenses, designed to meet varying degrees of flexibility, adaptability and access to collection information.

Licenses for supported operating systems and database servers must be purchased and installed separately. The choice of database management system will determine which server operating system is used.

Both Microsoft and Oracle require the purchase and use of a Processor license (or licenses) when using their respective database servers with a web-accessible application (such as eMuseum).

11.14. References

eMuseum by Gallery Systems (Gallery Systems)
<http://www.gallerysystems.com/products/emuseum.html >

12. MIMSY XG

12.1. Overview

MIMSY XG is the museum system for use by registrars, curators, archivists, and other staff members.

12.2. Developer

Willoughby Associates Limited

12.3. Target Organizations

Museums

12.4. Collection Items, Media Types and Formats

Any media files

12.5. Collection Size and Search Efficiency

An unlimited number media files can be added and displayed for each item in MIMSY XG.

12.6. Scalability

Determined by underlying database system (Oracle).

12.7. Interfaces and Web Compatibility

Client is required.

12.8. Interoperability

Users can export selected records from every module of the system into programs like MS Word and Excel.

It is preferred that the data arrive in one of the following formats:
- ASCII flat file with fields
- Microsoft Access 97, Access 2000, Access 2002, or Access 2003 MDB files
- Excel

12.9. Metadata Formats

Master Media Authority records are automatically created for the media.

MIMSY XG is compliant with all the following American and international standards:
- Larger Scale Initiative (LASSI)
- mda SPECTRUM
- Canadian Heritage Information Network (CHIN) Core Fields
- Dublin Core

- International Council of Museums (ICOM)

12.10. Security and Authentication

No information

12.11. System Requirement

MIMSY XG incorporates the Oracle (10g or 9i) database management system. Oracle, and therefore MIMSY XG, is available on multiple operating system platforms including Windows 2000, Server 2003, Windows XP Professional, LINUX, and several varieties of UNIX *

These are the Oracle components required for MIMSY XG:
Installed on Server
- Oracle 9i or Oracle 10g
- Oracle Networking Components

Installed on Clients
- Oracle Instant Client (with Java)
- MIMSY XG Software Application
- Report Generator (choice of ReportSmith or Crystal Reports)
- Oracle ODBC Drivers
- Crystal Reports Runtime Version

* See Technical Information (Willoughby) <http://www.willo.com/mimsy_xg/MXG-Tech-Specs.pdf> for detailed hardware specification.

12.12. Implementation Requirements and Technical Support

MIMSY XG allows the system administrator to easily customize the Master Catalogue screen for each user in their institution. These changes can be made by the system administrator in seconds.

Technical Support:
- Unlimited access to the MIMSY XG Help Desk Monday through Friday during the hours of 9 AM - 5 PM GMT for customers in the UK and 9 AM - 5 PM CST in North America, excluding holidays.
- E-mail support 24 hours a day.
- Assistance with report writing (for Crystal Reports and ReportSmith).
- Discounted rates for end-user advanced training.
- Direct troubleshooting of your system via remote access.
- Unlimited access to MIMSY XG Support on the Willoughby Web Site (available only to users with Web access), www.willo.com.
- Free upgrades to MIMSY XG running on the same version of Oracle on which your system was originally installed.
- Membership in the Willoughby Users Group (WUG) and membership in the Willoughby Users Group List Server (WUGLS).
- Quarterly MIMSY XG tutorials.

12.13. Pricing and Licensing

Pricing depends on a particular number of licenses, a custom package, or custom configuration, etc.

12.14. References

MIMSY XG: The Next Generation in Collections Management Software (Willoughby) <http://www.willo.com/mimsy_xg/>

13. iO Willoughby

13.1. Overview

iO replaces the traditional "flipping through index cards" interface with a web-like interface, resulting in a greatly reduced learning curve that makes the software easier to operate than other packages and opens up its use to a wide range of museum staff outside of collection specialists.

Features:

- Ability to hyperlink any word or phrase to any pertinent cultural archive on the Internet.
- User-definable Pop-Up Lists, Help Messages, and Field Labels
- Easy querying and reporting
- Integrated spell checker
- Rapid Data Entry™ module for designing data entry forms for different projects
- Graphic report generator
- Publications and People & Organizations Authorities keep track of books, articles, people and organizations (view)
- Global updating changes groups of records one group at a time
- Condition and Value Activities store historical information about items
- Drag-and-drop loan and exhibition functions (view)
- Digitized imaging with a light table (view)
- Unicode support allows multilingual museums to support applications in different language versions

13.2. Developer

Willoughby Associates Limited

13.3. Target Organizations

Museums. iO is perfect for institutions just beginning their automation efforts, as well as those who have outgrown less sophisticated systems. It is available in both single- and multi-user versions.

13.4. Collection Items, Media Types and Formats

Dissimilar materials — including objects, natural science specimens, photographs, archives, manuscripts, books and other printed materials

13.5. Collection Size and Search Efficiency

No information

13.6. Scalability

No information

13.7. Interfaces and Web Compatibility

Client is required.

13.8. Interoperability

No information

13.9. Metadata Formats

No information

13.10. Security and Authentication

Advanced security features and customizable user profiles

13.11. System Requirement *

iO will run under Windows 98 (Second Edition), 2000, ME, XP, & NT and in a variety of network environments.

In a multi-user installation, there should be a dedicated server intended to exclusively run the SQL Server component of iO.

* See iO Hardware Specifications <http://www.willo.com/io/io_techspecs.pdf> for detailed hardware specification.

13.12. Implementation Requirements and Technical Support

Annual support fees include the following features:
- Unlimited hot line support
- Monthly tech tips and newsletter
- Free enhancements and discounted upgrades
- Free remote support
- Membership in Willoughby Users Group

13.13. Pricing and Licensing

Pricing depends on a particular number of licenses, a custom package, or custom configuration, etc.

13.14. References

iO: Amazingly Easy Collections Management Software (Willoughby) <http://www.willo.com/io/>

14. Streetprints

14.1. Overview

Streetprint Engine - software for powering digital collections. Streetprint Engine is user-friendly free software solution for showcasing, teaching, and archiving popular print and other kinds of collections and artifacts online.

Streetprint is built upon PHP and MySQL, two industry standard open-source software packages.

Features:
- Catalog items by author/creator, publisher, city, document type, category, date, pagination, first lines, and more. Fields names may be customized
- Simple and intuitive administrative tools
- CSS layouts for precise control over the look and feel of the site
- Improved searching with basic and advanced options, binary operators, and more
- Automated syllabus and course page generation
- Upload fulltext information and media files
- Define custom artifact types, thematic categories, media types, and image types
- Optional user comment system, news posting, and glossary features
- Optional Dublin Core metadata with OAI-compliant repository
- User and record edit tracking
- Object-oriented architecture for future expandability

14.2. Developer

CRC Studio

14.3. Target Organizations

Libraries, museums, historical societies, etc.

14.4. Collection Items, Media Types and Formats

Only JPEG image files

14.5. Collection Size and Search Efficiency

Limited by underlying MySQL database

14.6. Scalability

No information

14.7. Interfaces and Web Compatibility

Web Interface

14.8. Interoperability

OAI-compliant metadata repository

14.9. Metadata Formats

Dublin Core metadata with OAI-compliant repository

14.10. Security and Authentication

No information

14.11. System Requirement

Because of its open-source roots, The Streetprint Engine doesn't require any proprietary hardware or software — it will run on almost any UNIX, Linux, Mac, or Windows web server with default installations of PHP and MySQL.

14.12. Implementation Requirements and Technical Support

Streetprint site's setup and maintenance is controlled through our simple and intuitive administrative web interface.

14.13. Pricing and Licensing

Free, open-source software.

14.14. References

Streetprint.org <http://www.crcstudio.arts.ualberta.ca/streetprintorg/engine.php>

15. Recommendations

This section summarizes evaluation of the DAMS by assigning grades by each evaluation criterion and weighting them by importance as described in the Evaluation Methodology section. The summary is presented in form of evaluation grid where score represents cumulative ranking of each DAMS.

Digital Asset Management Systems comparison grid

	Target Organizations	Collection Items, Media Types and Formats	Collection Size and Search Efficiency	Scalability	Interfaces and Web Compatibility	Interoperability	Metadata Formats	Security and Authentication	System Requirement	Implementation Requirements and Technical Support	Pricing and Licensing	Score
Factors:												**Score**
Importance	*2*	*3*	*2*	*2*	*2*	*3*	*3*	*2*	*1*	*2*	*2*	
DAMS:												
ContentDM	5	5	4	4	5	4	4	5	4	3	2	99
PastPerfect	4	5	5	2	2	2	3	3	5	5	3	83
Greenstone	3	5	4	2	5	4	5	2	5	5	5	99
DSpace	5	4	5	2	5	4	4	5	5	3	5	101
Fedora	5	5	5	5	4	5	5	5	5	2	5	112
Hyperion	3	4	4	5	5	4	4	5	4	4	2	96
MetaSource	3	5	4	5	5	3	5	5	4	3	2	97
Curator	1	1	1	1	1	1	1	1	1	1	1	24
EMuseum	2	3	4	4	5	2	2	4	4	5	2	77
MIMSY XG	2	2	5	4	2	2	2	3	3	4	2	65
iO Willoughby	2	5	3	2	2	2	2	4	5	5	2	72
Streetprints	4	2	4	4	5	1	2	3	4	5	5	79

It is important to note that all systems were credible repository systems, however, DSpace, Fedora, and Greenstone scored highest.

DSpace is a good system, whose strengths lie in its interoperability and security. It can still be used by any individual institution.

Fedora offers a good infrastructure with scalability and interoperability in mind. Fedora was designed as an infrastructure for institutional repositories, where multiple and disparate repositories co-exist and whose content is aggregated. This can be achieved by publication of metadata via an OAI harvester and full repository functionality. Custom development on Fedora itself will be harder than the other DAMS evaluated, however it is not foreseen that much development is needed on Fedora itself.

16. References

Texas Heritage Digitization Initiative (2006). Standards and Best Practices: Draft Proposal Approved by the THDI Standards Work Group.

Technical Evaluation of selected Open Source Repository Solutions (Open Access Repositories in New Zealand) <https://eduforge.org/docman/view.php/131/1062/Repository%20Evaluation%20Document.pdf>