

**Digital Object Repositories Explained**  
**An Intrallect White Paper**  
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## **Introduction**

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A digital object repository offers organisations a simple and effective way to manage digital resources. It acts like an online library through which the organisation can share its digital resources among those who will benefit – staff, clients, members, students, potential clients, the public. The purpose of the repository is to support the organisation’s policy on use of its digital resources. There may be several different policies for different groups so the repository must be flexible. This white paper explains the benefits an organisation can gain by using a digital object repository.

## **Why?**

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Organisations come in many shapes and sizes: in the commercial sector they may be businesses from SMEs to large international corporations; in government they may be major health service providers, tax authorities or specialist services such as air traffic controllers; in education they may be local authorities managing primary and secondary schools or universities and colleges; across all of these we also find trade and professional bodies. One thing all these organisations have in common is a massive use of digital resources.

The main reason most organisations prefer digital resources to physical resources is that they can be stored, distributed, shared and reused much more readily. Yet everyone can quote many examples of duplication of effort, inability to locate files, uncertainty over how resources can be used, and other barriers like technical incompatibility that prevent the effective reuse of digital resources.

Resources may be documents, images, video or audio clips, presentations, online training modules, web pages, animations, forms or assessments. At one end of the spectrum there are simple assets such as an image or a table of figures which can be used and reused in many different contexts. At the other end may be a structured online training course with different pathways or a detailed simulation which might be used in presentations, training or business modelling.

Digital resources may have a shelf-life from a month to a decade or more but each time a resource goes undiscovered and under-used the organisation suffers a penalty in terms of time and effort wasted, opportunities missed or competitive advantage lost.

## **Benefits**

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### ***Business Benefits***

#### **Financial**

Digital resources are often expensive to produce – marketing collateral, video of key processes, research outputs, online training courses, guidelines and checklists, and many more. Most of these resources can be used or adapted for use in other parts of the organisation. Marketing material originally used for print media may be adapted for reuse in presentations or in training. Examples from online training may be adapted to marketing case studies. Key graphs and tables from research outputs may be reused in white papers, or training, or sales presentations. Each reuse gives a substantially greater return on the original investment. Reuse is dependent on the digital resources being discoverable and adaptable. This is the purpose of the digital object repository

The reuse of digital resources need not be limited to internal reuse. Resources originally planned for staff may be useful to potential clients – checklists to help support purchasing decisions - or to sales channel partners - adaptable marketing resources.

#### **Knowledge management**

The fast-moving, ever-changing, modern information universe has shifted the emphasis away from expecting people to say “I have the knowledge” to “I know where to find the knowledge”. This not only applies to factual information but also to training, skills development and competency-driven roles. A digital object repository ensures that staff can always find the resources they need to carry out their job, to improve their skills, and to make a very effective contribution to the organisation.

#### **Opportunities**

How often are new opportunities missed because an organisation cannot respond quickly enough? This might be a university asked to provide a specialist training course as CPD for a commercial organisation, or a health authority required to provide extensive staff training to counter a new imminent health threat, or a business responding to a call for tender at short notice. When digital resources are easily discoverable and adaptable it makes it much easier for an organisation to be nimble in response to new opportunities. The digital objects in the repository form a base from which new digital objects can be rapidly produced to meet the new requirement.

#### **Quality management**

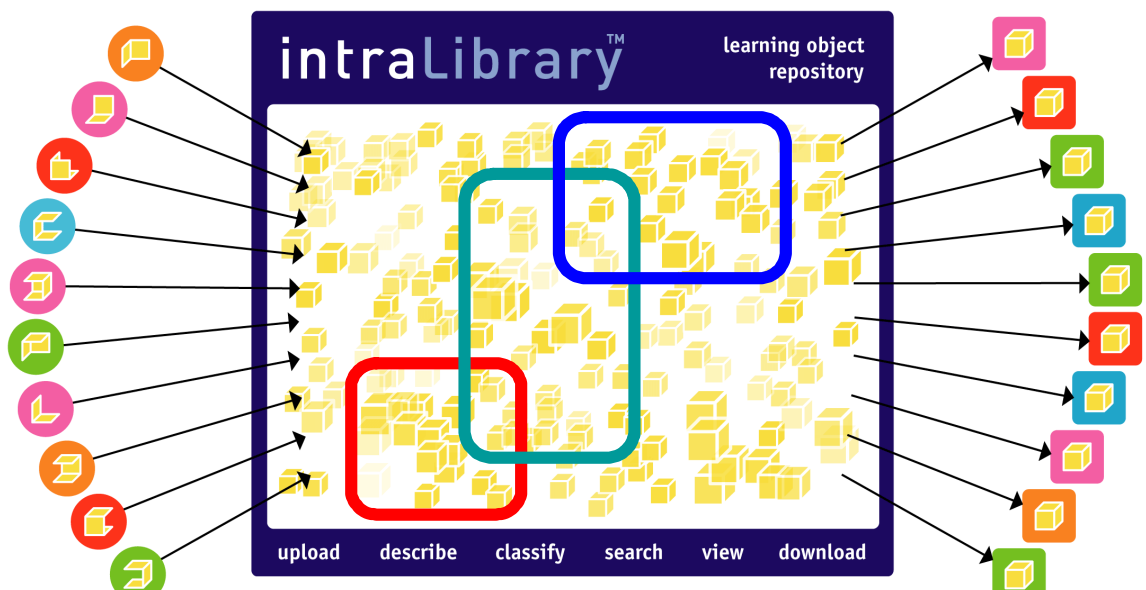
One of the risks associated with widespread sharing of digital resources is that the quality of resources may be quite variable. However, that is easily

managed through quality assurance workflows that are configurable to the needs of individual organisations and departments. By applying these quality assurance procedures the repository becomes a source of quality assured material and reduces the risk of using material from less reliable sources.

## Management Benefits

### Asset management

In most organisations digital assets are produced by a wide range of different people. They are also used by many other people for purposes that may have been unforeseen originally<sup>1</sup>. It is in the interests of the organisations to maximise both the contributions for sharing and the uses to which they are put. A useful analogy is the much greater use a book has when it is in a library than when someone reads it and saves it on their own bookshelf, perhaps never reading it again.



Many organisations are not even aware of all the assets they own, either those that they have commissioned or that have been produced by their own staff. If modern organisations managed a digital asset register in the same way as they manage registers of property or IT equipment then the value of

<sup>1</sup> General Motors increased its income from licensing photographs and films of cars, people and production facilities from \$4 million to \$25 million per annum when it adopted a digital asset management system. [http://www.emedialive.com/r2/2001/doering8\\_01.html](http://www.emedialive.com/r2/2001/doering8_01.html)

these digital assets would be immediately recognised as substantial. In information-intensive organisations it may be reasonable to assume that staff spend 5% of their time creating digital assets. Then the value of digital assets could be growing at 5% of the salary costs each year.

Even if the figure is only 1% of salary costs this suggest that any substantial organisation must manage its digital assets carefully, including the ability to keep track of these assets after the creator leaves the organisation and to monitor the rate of use of the assets.

## **Security**

Associated with management of assets is their security. By using a repository an organisation can easily ensure that all the assets are properly backed-up and that they are accessible to anyone who is authorised. Through collection management different parts of the repository can be made available to different groups. While a web-based repository is easy to access from any computer using a web browser it can also be kept secure through user names and passwords.

## **Rights management**

In some organisations it is simple to manage the rights associated with the digital resources – the organisation owns all of them. However, this is not always the case. Some digital resources may have been licensed from third parties, or may be shared across a consortium of organisations, or come from the collections of individuals. In all of those cases it is important to record the ownership and licensed rights of each digital object on an object by object basis. This leads to one of the key tenets of a digital object repository – that objects should be “usable at the point of discovery” – it should be immediately apparent on discovering an object what is and is not permitted.

## ***Technical Benefits***

### **Interoperability**

Incompatibility between systems has been a barrier to sharing digital resources for many years. While single file assets such as MS Office documents, images, PDF files and Flash animations are now widely supported across a range of platforms, more complex aggregations of files still posed a problem. For example, a short training course that consisted of several “pages” with navigation through the course depending on the outcome of assessments en route could play in one proprietary system while being rejected by others. Now however packaging standards exist for these complex objects which makes it possible for someone to create an object with one tool and upload it into a repository, download it and modify it with a different tool and upload the new version, then download either version and

use it in a learning management system. These standards<sup>2</sup> have enabled true interoperability and portability of complex objects.

## **Web 2.0/mashups/RSS/SOA**

While it isn't necessary to understand the details of new technologies it is important that all organisations are aware that they exist and that they may have a significant impact on their business model. The integration of businesses such as Google Maps, Amazon and SalesForce with others is creating many new opportunities. Web-based applications have entered an era in which new business benefits can be easily generated through the synergy between two or more previously independent applications. Digital object repositories with "web services" interfaces are ready to join this world of application integration.

## **Implementation**

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Digital object repositories exist to support each organisation's policy on digital asset management. It is the job of the repository to meet the requirements of the policy – not the other way round. This means that the policy should exist before the repository and the repository should be flexible enough to fit the policy. Some of the issues that usually need to be addressed are:

- **Who does what?:** The most common type of user of a digital object repository is a "consumer". Someone who uses the repository to quickly discover digital resources and use them. As this is the most common task it needs to be easy and effortless. Searching, browsing and personalisation all make it easy for individuals to use their own preferred discovery strategies. However, discovery of suitable resources depends primarily on two factors, 1) sufficient resources must be available, 2) they must be described suitably to discriminate effectively between them. This highlights several other important roles associated with the repository. One key role is that of "contributor". For a well-stocked repository it is best to enable large numbers of contributors. This avoids bottle-necks but has the added benefit of encouraging buy-in and the development of a user community. Another important role is that of "librarian". However, this role may actually be performed by several different people taking on different aspects of ensuring the quality of the catalogue – rights management, technical evaluation, classification, quality assurance, version control.
- **One repository – several policies:** It usually takes very little time to realise that a digital object repository can support different policies for different groups. A group developing digital material, for example

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<sup>2</sup> IMS and SCORM ([www.imsproject.org](http://www.imsproject.org) and [www.adl.net](http://www.adl.net))

marketing collateral or training material, may want to use the repository to share raw resources within the development group while making the final products available to a much wider community. In another case a company may decide to make its white, papers, selected research outputs and product datasheets available to potential clients while restricting access to many other resources to internal staff. This can be managed easily with a digital object repository that supports user groups and limited access collections. Not only can this tailor access for different groups but it can also ensure that each work group can use their own workflows and allocate roles on a group basis to balance the effort and skills in each work group.

- **We are unique:** Of course every organisations is unique in some way. In many cases terminology is very specific and the digital object repository needs to allow each organisation to not only use its own terminology but perhaps also define the relationship between these terms. It is also likely that if the repository is used to share resources with external communities then each organisation will want to be able to define its own licensing arrangements under which the resources are made available – often several different licensing arrangements are needed to support different communities from the same repository.
- **Change management:** Any new system bring with it change management issues. However, discovery and use of digital resources is already a common working practice for many people. The use of a digital object repository which has powerful search and browse tools and contains quality assured resources can greatly reduce the effort of most of its users. No technical capability beyond the use of a standard web browser and the ability to cut and paste or download is required of consumer users. For contributing users and those involved in configuring the repository a phased roll-out plan is beneficial as the flexibility of workflows and work group roles is often best appreciated through practical examples.

## Examples

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### BBC

The BBC is investing £150M in its Jam initiative<sup>3</sup>, to provide learner-centred, curriculum-based content that will be free and accessible to all pupils, teachers and parents. The online materials will be used in the classroom, at

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<sup>3</sup> <https://jam.bbc.co.uk/>

home, and at community learning centres throughout the UK. The material is being developed in a series of "commissions", eventually covering up to half of the UK curriculum.

BBC Jam is managing its content commissions, using Intrallect's intraLibrary digital object repository through the highly-configurable workflow system. The BBC team have implemented workflows to test, review and publish learning objects delivered by both independent and internal production teams. IntraLibrary's strong support for standards for educational content, such as SCORM 2004, help the team trace, view and re-use packages of content, in whole or in part.

## **SIESWE**

The Scottish Institute for Excellence in Social Work Education (SIESWE) is a body funded by the Scottish Executive. Originally embodying the nine Scottish Universities offering social work education, SIESWE has expanded during 2006 to offer its digital object repository, the Learning Exchange, to staff and students of Scotland's Further Education Colleges, and by 2007 to all social work agencies.

The support for standards has made it possible for each member institution to use their own technical infrastructure yet still share and benefit from the resources in the Learning Exchange. Other features which particularly appealed to SIESWE include the use of the national authentication scheme ATHENS, the use of comments to include a form of review on all resources and enhancements to allow images from digital cameras to import the descriptive information from the photographer's camera.

## **EUMETCAL**

EUMETCAL is a body which was established to share resources among the European National Weather Services, focussing on training. This very technical training involves various forms of media including digital weather maps, satellite images, data, video and audio. While each country carries out very similar training their available budgets are very different. Through EUMETCAL and its digital object repository smaller countries can have access to resources produced by larger countries and larger countries can collaborate to avoid duplication of effort. When new technologies arrive, such as new weather satellites with innovative features there is a need for training of very large numbers of staff as quickly as possible and sharing resources through the digital object repository makes this possible.

## **Conclusions**

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Digital object repositories are an essential part of the infrastructure of any information-dependent organisation. Adopting this repository technology gives organisations a perfect opportunity to examine the value of their digital

resources and consider the potential for reuse of resources in other aspects of their business.

Education and training is not only one of the key areas in which digital object repository can make a significant difference but it is also the most challenging. Training objects are often among the most complex. Ensuring they can be discovered requires good quality description and competency mapping.