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Sharing eLearning Content – a synthesis and commentary

Final report

Authors of this report

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Reading this report

This report is intended for public circulation, for project staff and stakeholders, members of the community involved in elearning activities and those providing services for them.

We use 'sharing' to mean 'sharing elearning content' except where we feel it necessary to be specific for clarity.

Project names appear for the first time in **bold** in the text. Where they are abbreviations they are not expanded in the text but they appear with a fuller reference in Appendix 2, the project list. Other abbreviations and jargon are expanded in Appendix 6.

Any URLs (websites) quoted herein were last accessed on or before 14 August 2007.

Acknowledgements

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1 Executive summary

> *… the application of technology to education has great potential but for that potential to be realised it needs to be linked to a change in the way our institutions work and are structured and the way people work within them.* **TrustDR**, After the Deluge (Dripps, Casey and Proven, 2006)

A scan of the projects we have examined shows much concern over cultural, legal and organisational issues. Most feel that sharing elearning content will not take place unless these issues are addressed, and many feel that such issues have been overshadowed by an emphasis on technical solutions. Clearly developing the right technology for sharing is a necessity, but putting technical solutions in place without institutional commitment or knowledge of user requirements is likely to be unproductive. In addition, although many projects speak of organisational and cultural issues as their main concern, in fact these issues are often underpinned by concerns, uncertainties and misconceptions about copyright law, ownership and IPR (intellectual property rights).

In this study of over 30 projects, their reports, background papers and other relevant websites and documents, a picture emerges showing relatively little formal, large-scale sharing via repositories with appropriate licensing and a lot of informal, small-scale sharing with colleagues and collaborators. It could be argued that this serves the sector well and that under the cover of confusion about ownership and legal issues, enough sharing is going on to 'oil the wheels' of FHE. We believe that this is not sustainable for two main reasons. First, the large-scale sharing which is needed to improve the quality and cost effectiveness of teaching within and between institutions demands large-scale formal sharing mechanisms, proper licensing, and the management of both. Second, in the era of the digital copy, with the increase in the use of web services (such as Facebook, MySpace, Flickr etc.) for publication/upload as well as consumption/download, people who previously sent individual emails to colleagues, or shared via CDs or memory sticks, may be tempted to share more widely without appreciating the legal implications or possible outcomes.

The projects we have looked at have found that many people would like to share with small groups or to restrict access to their materials. Underlying this are insecurities about quality and attribution issues and uncertainties about IPR and ownership. Harnad, Oppenheim and others have pointed out that copyright is a not a system designed to address these concerns. We also highlight an erosion of the fabric of trust within FHE, perhaps exacerbated by these concerns and uncertainties. We recommend that they are addressed by:

1. promoting the excellent work done by some of the projects we have examined;
2. the clear expression and implementation of organisational commitment to sharing;
3. the technical development of tools to support sharing, particularly to allow attribution, acknowledgement; and the collection and use of approbation, reviews and attention metadata also the automation of creating and attaching appropriate administrative, access, rights and preservation metadata
4. making available facilities, preferably within Jorum, but otherwise institutionally, to allow limited group sharing via passwords and by restricting access;
5. specifying, promoting and using one or a limited number of open content type licences or developing a 'Learning Commons' licence, emphasising attribution, specifically for UK FHE institutions to share learning resources, taking into account the likely impact on authors' motivation to embrace sharing;
6. making sharing easy, using this licence as a default, via Jorum, with online support and explanation of the implications of the licence;
7. encouraging staff training and development to address the uncertainties and concerns expressed.

Detailed specific recommendations have been made to JISC but omitted from this public version of the report at JISC's request.

2 Introduction

It is a holy grail of elearning that content, be it raw media assets, information or learning objects, learning activities, or learning designs, should be made once and used in learning many times, either unchanged or modified. Behind this aspiration lies a complex web of interdependent issues, which are the subject matter of this report. The prime motivations are:

- the improvements in quality and consistency that can be achieved if many people with complementary expertise and experience are able to contribute;
- the efficient use and reuse of the public money that is spent to develop these sometimes very expensive collections, objects or artefacts;
- the subsequent freeing of staff effort to concentrate on pedagogical issues and the delivery of materials consistently within institutions (and then across institutions):

> *the real benefit in sharing materials is not so much the materials themselves (although they are clearly important) but the fact that they are being shared. Sharing materials means some of the prerequisites for improvement have been reached – with academics being more concerned with teaching than the logistics of delivering content.* **TrustDR***,* After the Deluge

Our report is a synthesis and commentary based on an examination of over 30 JISC-funded/identified projects and on over 70 papers and outputs from these projects. The work took place between May and September 2007. We include in the report quotes from those projects which we think are relevant and we make recommendations, some of which come directly from those projects and others which are our own but flow from our synthesis of the experience of those projects. The underlying aim of the recommendations is to encourage the development of an environment which will support the JISC community in sharing elearning content effectively.

The report and the recommendations are organised by agreement with JISC under five main headings taken from categories given in JISC's *Invitation to Tender* for the work:

- Cultural
- Legal
- Organisational
- Technical
- Pedagogic.

The issues examined in the synthesis tend to be multidimensional. So there is unavoidable overlap, which we have dealt with by allocating content to sections according to the issue on which we think that content has greatest bearing.

3 Methodology

The projects that we examined[1], across a number of JISC programmes, were selected by JISC programme managers David Kernohan, Lou McGill, Neil Jacobs, Lorna Campbell and Phil Barker. In addition to looking at the websites and outputs of projects selected by JISC, we examined evaluations and contextual information regarding these projects; and we administered a questionnaire to an agreed selection of relevant project holders and related individuals, to which we received 23 useful replies, many of which cited several further outputs and reports, some providing us with references to publicly available materials, others providing us with unreleased draft copies of final reports. Most respondents also provided us with informal comments, which were very valuable in our necessarily rapid process of familiarisation with each project. We also interviewed a small number of respondents by telephone. The size, scope, budget, orientation (inward or outward focussed), duration and concerns of these projects were very variable. We have largely taken the outputs and outcomes of these projects on trust, that is to say it was specifically outside our brief to pursue the findings to see if they are backed up by evidence, to judge relative budgets, to do cost benefit analysis or to evaluate the performance of projects. Naturally, it is within our brief to use our experience and knowledge gained from other work (for JISC and other FE, HE and public sector clients) to judge the relevance and substance of the findings we have encountered.

Most of the projects will have had useful outcomes and outputs which are not relevant to *Sharing eLearning Content*. So little or no mention of a project does not imply any comment on that project's success or failure.

4 Cultural issues

4.1 Attitudes to ownership and attribution

It seems from all the feedback we have encountered during this work that authors of learning materials are concerned with quality, correct attribution and the prevention of distortion and misuse of their materials. Monetary reward (or the loss of it) is mentioned as a potential driver for (or barrier to) sharing, but somewhat surprisingly altruism seems to be as strong a motive; **Rights and Rewards** point out that

[1] The full starting point list can be seen at: http://www.ukoln.ac.uk/repositories/digirep/index.php?title=SharingeLearningMaterialsSynthesis

> *In relation to the types of restrictions and conditions participants would like to place on their materials, over three quarters (75.1%) of participants wanted the author of the contributed material to be attributed. ... Interestingly, fewer participants wanted their institution attributed, yet in most cases it is the institution that is the actual copyright owner.*

This is an interesting point in terms of understanding the issue of 'emotional ownership' of the material; respondents apparently do not see it as their role/goal/purpose to promote their institutions through the material, even if the institution legally owns it. This demonstrates quite effectively a disjoint in the perceptions of academics and their employers in terms of the value added by the material. Academics see it as promoting themselves; their employers would probably see it as promoting the institution (these interests are not necessarily incompatible, but equally they are not necessarily complementary); in neither case would the primary purpose of dissemination be direct financial or commercial gain.

In this environment, it is clear that agreements which protect and recognise authors' rights are more suitable than mechanisms to enforce copyright or DRM (digital rights management) systems. In this report we mention Creative Commons[2] as a candidate or possible basis for such licences. However, the Creative Commons model is not necessarily a panacea for all situations and one of the authors of this synthesis has written in detail about the problems of simply trying to import Creative Commons-based models to the arena of sharing academic scientific research datasets[3]. It may be that an authors' rights or 'Learning Commons' agreement could be based less

> *on the utilitarian model of copyright espoused by the Common Law tradition*

and more on authors' rights (*droit d'auteur*) such as the acknowledgement or attribution right in UK law or rights enshrined in other European legal systems or the Civil Law tradition. For authors of learning materials, even more than researchers:

> *To fail to at least consider doing so, is to ignore the possible benefits of incorporating a legal tradition that, perhaps, corresponds most closely to the way in which researchers [and elearning resource creators] aspire to work and collaborate.* **Charlesworth**, 2006

Commissioning a piece of practical research which might create and recommend such a 'Learning Commons' licence is one of our recommendations[4], and subsequent mentions of Creative Commons in this paper should be read with this in mind.

4.2 Cultural implication of Web 2.0 for sharing

While our experience leads us to remain sceptical about the popularly held view that FHE institutions are about to welcome an influx of hyper-e-literate teenagers, we must recognise that many new students will have had exposure to a number of sharing and social networking services and that even amongst staff change in attitudes can be rapid. David White of **SPIRE** notes that:

> *The majority of current elearning works with static content in tandem with collaborative or discursive spaces such as forums. A challenge for elearning in the near future will be in finding ways in which it can engage in the flow of knowledge that these services provide whilst still working within an identifiable and educationally assessable structure. (White, June 2007)*

Referring to the data they collected as part of their survey[5] on the use of online ('Web 2.0') tools, he says:

> *The challenge is in finding ways of linking the institutional online world with the expanding online environment that users engage with on the wider web. This is especially pertinent given that a significant amount of the web 2.0 type services referred to in the survey are being used for study.*

While emphasising the complexity of the environment and the need for caution before making assumptions based on such data, he also mentions that

> *Dr Terry Anderson used the two overall usage charts for Web 2.0 services and institutional services to demonstrate that the new services on the web are used by the young, and the traditional academic style services in universities are used more by older individuals. This, he claimed, pointed to an impending culture clash and evidence of the disconnect between institutional culture and what is taking place out on the web.*

This chimes with the findings from the very interesting and surprising work noted by Martin Poulter at the University of Bristol. He comments that:

> *Students regard email as a formal communication channel, for keeping in touch with 'older people' such as tutors and parents.* […] *For communicating with each other, they use instant messaging.* […] *students say they want video podcasts, or failing that audio, of their lecturers. They don't want less personal contact with teaching staff, but they want to be able to catch up with lectures on a video iPod on the train.*
> Poulter, 2007

Franklin and van Harmelen in their study for JISC *Web 2.0 for Content for Learning and Teaching in Higher Education (May 2007)* list many unresolved problems with the use of Web 2.0 in universities:

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[2] http://www.creativecommons.org.uk/
[3] The International Journal of Digital Curation, http://www.ijdc.net/ijdc/article/view/7/6
[4] JISC's IPR Consultants have recently been doing a study on the use of Creative Commons in education, which may answer this need.
[5] http://tallblog.conted.ox.ac.uk/index.php/2007/03/16/some-real-data-on-web-20-use/

IPR for material created and modified by university members and external contributors; appropriate pedagogies for use with Web 2.0 (and equally which pedagogic approaches are enhanced by the use of Web 2.0); how to assess material that may be collectively created and that is often open to ongoing change; the choice of types of systems for institutional use; how to roll out Web 2.0 services across a university; whether it is best to host the services within the university or make use of externally hosted services elsewhere; integration with institutional systems; accessibility; visibility and privacy; data ownership; control over content; longevity of data; data preservation; information literacy; and staff and student training.

All these problems have been and are ongoing concerns for sharing learning content. They are not really technology-specific. Just as the advent of the Web cast a fierce spotlight on structural and institutional inefficiencies in the holding and dissemination of information, so Web 2.0 will illuminate inefficiencies and inadequacies in situations where it is, or may be, sensible to share the creation, management, maintenance and use of learning content. Similarly the authors point out a problem with the assessment of group work that uses Web 2.0 tools. Which prompts the question of group work (which has happened in lively pockets for many years without Web 2.0 and often without IT) – how are we assessing it anyway? To meet the challenges posed by Web 2.0 in terms of interoperability, retention and preservation, and rights[6], it will be necessary and desirable to accept the widening possibilities offered by such tools and services and to provide examples of best practice by using them well and for the pursuit of excellence.

LOR design should reflect the needs of the user, for instance through the adoption of web 2.0 functionality and behaviours. **Colin Milligan***,* CDLOR

It would be interesting for new projects to explore tutors (students and academic institutions) use of social and professional networking tools (e.g. MySpace, Facebook and others). Research could look at whether communities of tutors are forming there and if so how are they sharing resources and furthering their professional development within these tools. **Anne Gambles**, PROWE

4.3 Attitudes to sharing

…tutors are indeed willing to share e-resources, but that willingness depends on 'who with' and 'how'. **Andrew Rothery, University of Worcester***,* WM-Share

Sharing is a major theme [in responses] *in the way the target audience is already using the internet for other things. As is flow or flux. These two themes are poorly represented* [in UK FHE]. **David White**, SPIRE

Even when people collaborate on the design of eLearning materials the results are not easy to share. Our academics preferred to share students rather than share learning materials. **Hugh Davis** DialogPLUS

We attempted to kick start the process of sharing by focusing on the positive altruistic reasons for sharing. This involved working with the keen people within the community to begin with. We also built in different access levels into our repository so that depositors could keep materials private, share materials with a specific group (e.g. a department), share internally or make materials completely open. **Steve Loddington**, Rights and Rewards

[the Jorum focus group] *called for initiatives to engender the cultural change that is required as a prerequisite to the establishment of services within an elearning culture.* **Jorum**, User Evaluation

Attitudes are very important and take time to change. It needs a cultural change within institutions for people other than enthusiasts to share (staff are happy to download … uploading is not so familiar or so obviously beneficial). Our recommendations in the other sections of this report try to take account of the attitudes expressed above, allowing potential sharers to get what they want, while also providing training, awareness and clarification to help prevent misconceptions.

4.4 Who is sharing and how

The Community Dimensions of Learning Object Repositories (**CDLOR**) project was funded by JISC to *identify and analyse the barriers and enablers that influence implementation and use of learning object repositories (LORs) within a range of learning communities*. They found that of the respondents to the CDLOR survey[7], the biggest group were teachers, closely followed by learning technology support and educational development support workers. 87% of respondents shared their teaching resources for comment and collaboration, and of these 75% did so by email and a surprisingly large 27% 'by hand' (an indication that this is likely to be small-scale and informal sharing). Of these, 80% shared with departmental colleagues, 33.1% within the institution and 22.9% with other UK institutions. This work is backed up by similar findings from WM-Share[8], with 75% sharing with departmental colleagues and 31% within the institution, although their sample of teachers shared less outside the institution (possibly around 15%, the figures are not directly comparable here)[9]. **RepoMMan**[10] also find that 90%

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[6] We suggest elsewhere that it would be better for staff (and students) to be contributing via a 'Learning Commons' section on Jorum rather than signing up to the terms and conditions of Facebook.

[7] CD-LOR Deliverable 7: Report on Personal Resource Management Strategies

[8] WM-Share Survey – Sharing Digital Teaching Materials

[9] Interestingly, when they are using teaching and learning materials over half of the WM-Share respondents use web pages and images created by others; for video clips, documents, presentation slides, interactive quizzes and audio the figures range from 28.5% to 41%.

[10] http://www.hull.ac.uk/esig/repomman/downloads/R-D3-research_survey_data_11.pdf

of their respondents share materials but they find over 50% sharing outside of their institutions[11]. Findings from the three projects indicate that little use is currently made of repositories for sharing content but that informal and small-scale sharing is practised widely, the vast majority through email with a significant element through personal websites. The surveys also show a significant degree of confusion about ownership of teaching materials. All three projects comment on the level of confusion amongst staff, with CDLOR noting that 20% of their respondents thought (probably incorrectly) that they themselves owned the copyright, while 17% admitted that they did not know who owned it. WM-Share report 17% claiming to own the resources individually, 22% were unsure and, although respondents were asked to tick one option only, 14% ticked to state that both they and their institutions owned the materials they produced.

> *This is indicative of the current lack of clarity and in many cases lack of explicit policies with respect to ownership of resources, both within the UK and internationally. Lack of awareness of copyright ownership has been identified by previous studies (e.g. Bates et al, 2006 Cadd et al, 2003). This lack of clarity could be a barrier for wider uptake of repositories in teaching and learning.* **CDLOR** survey

4.5 Differences between institutions and sectors

For research-led universities promotion has typically been dependent on research outputs (publications). Learning materials have been lower status and less considered in career progress. This is changing, but slowly.

> *Does sharing of learning objects work in a research-led university? The outcomes of our project demonstrated that maybe we are trying to share the wrong things.* [...] *Our academics preferred to share students.* **Hugh Davis**, DialogPLUS

With institutions which focus mainly or wholly on teaching and learning (some new universities and most FE colleges), it is easier to see the value of elearning content. Some FE colleges are interested in sharing as a shop front; others want to sell their content and see it as a potential revenue stream.

There are interesting similarities and differences between attitudes and readiness to share research as compared with learning materials. Trust is a key issue for both (we examine trust in depth later) as are attribution, incentive, reputation and approbation. In both areas, authorship or lineage is used as an important guide to quality:

> *By reviewing the authorship of a resource they could make decisions on the resource's authority and legitimacy.* **PROWE**, Metadata report (Whitelaw, 2007)

Of course, for researchers there are built in financial, reputation and organisational incentives for sharing (although one must not assume that researchers always want to share their outputs). Research is needed to see whether similar incentives could be made to work for elearning materials, without creating a structure like the UK's Research Assessment Exercise (RAE). We recommend that JISC commission work comparing the similarities and differences between practitioners' attitudes towards sharing their research and learning materials; focusing on the roles played by and the potential for incentive, reputation, attribution, approbation and trust. This work should include looking at staff involved in teaching and research and also staff only involved in teaching, across a variety of institutions.

Many academics are wary of sharing elearning content either because they don't know if they can or because sharing involves a complex signing-off process. Some share materials not knowing that the institution actually owns them; others do know but choose to ignore the fact, either with or without the tacit approval of the institution. Others are put off by the form of other content available on the web – i.e. they think their own materials are not good (or flashy or impressive) enough or just too simple to share.

Some projects, for example **EERN**, touched upon what might best be described as the political economy of sharing elearning content. In this area there is established research from outside the elearning domain[12]. One conclusion from EERN was as follows:

> *At a more strategic level, we would recommend that JISC needs to fund a strand specifically addressing the management of change issues. This would involve projects that shift the focus away from learners and practitioners to other stakeholders (e.g. managers).* […] *What are the implications of elearning for the way institutions and practitioners will need to organise and administer teaching and learning in the future?* **EERN**, Draft Final Report

There is a need to collect and collate further information on management of change within a variety of existing institutions and also to seek opportunities to 'test' such lessons in developing and implementing an elearning approach to new (or greenfield) sites.

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[11] This finding is complicated by the fact that RepoMMan are asking primarily about research materials, although 63% say that their responses would not have changed had the focus been on teaching and learning materials. This may imply that RepoMMan's higher figures indicate *attitude* to sharing teaching and learning materials outside the institution whereas CDLOR and WM-Share are more indicators of current *practice*.

[12] For example: Steven Weber's 'The Success of Open Source', Harvard University Press, 2004; Seely Brown and Duguid's 'The Social Life of Information', Harvard Business School Press, 2000; or the work of Yochai Benkler, which is now available in 'The Wealth of Networks', Yale University Press, 2006.

5 Intellectual property, ownership and legal issues

5.1 Context

> *… the barriers to uptake of the innovative approaches that we aimed to develop had little to do with technical infrastructural issues, and were much more to do with encouraging institutional adaptivity. … Whilst the technical aspects of online learning and teaching were not problematic for us, there are still legal barriers, including IPR and copyright, to sharing resources either directly or via repositories. Simple local, national and international guidelines and processes are needed otherwise the community will err on the side of caution.* **DialogPlus**, Final Report (Davis et al, 2007)

> *Minefield of legal issues - we are aware of most of these and are dealing with them but no practical resolution to common problem in HE of persistent breach of copyright - by staff and students. Stifles creativity but most common practice for creating teaching and learning material is illegal! Students conducting common design work offline is acceptable but transferring this online is illegal.* **Caroline Breslin**, DIDET

> *A lecturer might create a PowerPoint presentation, upload it to the web, and allow others to use it. However, that lecturer may not have the right to allow others to use it. Strictly speaking the university, not the lecturer, should give permission for its use. This whole area is clouded by confusion since agreements are seldom written, traditional practice is often contrary to the legal situation and both managers and teachers are unclear.* **WM-Share** E-sharing … (Bell and Rothery)

The picture that emerges from a review of the projects, in particular **TrustDR, CeLLS** and Rights and Rewards in Blended Institutional Repositories, is not an unfamiliar one. Despite the numerous studies, reports and recommendations that have been produced over the past decade by JISC, HEFCE and others, attitudes towards intellectual property rights, and specifically copyright, remain an inhibitory factor in the adoption of innovative teaching and research strategies. This has been exacerbated by the increased importance attached to intellectual property rights in the digital environment and the resulting need to pay more than lip service to the concept of legal compliance.

While academics and other staff engaged in the construction of learning resources wish to comply with copyright law, there are considerable frustrations with the apparent complexity of the processes involved. In the past, FE and HE institutions have, broadly speaking, displayed a relatively amateurish approach towards intellectual property rights, and despite a few institutions finding themselves made examples by rightsholder organisations, such dilatory approaches towards protecting rights in their own works, and respecting others' rights, have largely gone unpenalised. In the digital environment, institutions which do not adopt a professional approach to copyright will increasingly find themselves financially and operationally penalised for failing to protect the rights in their own works; and subject to civil, and potentially criminal, actions for failure to respect the rights of others.

A thriving educational and research sector requires an information environment which is as open and unrestricted as possible; however, this requirement for openness can often come into conflict with authorial and rightsholder aims and objectives. An increasing ability to commodify existing and new types of information resource has coincided with an increasing expansion of rightsholder privileges, e.g. extension of length of copyright term and the creation of database rights; and concomitant pressure for the diminution of public rights of access, e.g. fair dealing and library privileges. Such changes make it imperative that members of further and higher education institutions, both academic and administrative, are sufficiently well informed to be able to take the necessary steps to ensure that access to information resources is not unduly, or unnecessarily, hindered. Currently, there is a failure to embed adequate training in IPR for academics/lecturers/staff into staff development processes. If IPR education is presently done at all (and it usually isn't), it is in an ad hoc and unstructured fashion. Differing training techniques and educational messages add to the false perception that copyright is 'highly complex' and not something that staff can be expected to handle. Talking about the need for training does not address the fact that even if institutions take that message to heart, there are insufficient *FHE-experienced* training staff currently available to undertake it. This is not something that can be left to the occasional visit of a copyright consultant, or a law firm, partly because of the expense and partly because the focus of non-FHE-experienced trainers is often on issues antithetical to the goals of sharing elearning content. The number of suitably experienced trainers across FHEIs at the moment is low; wholesale training in IPR and sharing elearning content will require appropriate trainers. We don't have them at the moment, but we could and should.

It is disheartening to find institutions and projects still claiming that IPR issues are 'a minefield', when so much work has been carried out in this area by both JISC and other organisations and authors. Recommendations and reports have been made in the past – most of the previous two paragraphs are copied from Andrew Charlesworth's August 2005 report on the JISC Rights in Digital Environments (RIDE) workshops. The speakers at the workshops were Professor Charles Oppenheim, Prodromos Tsiavos, Ed Barker and Ralph Weedon. The workshops identified:

> *a general lack of co-ordination on policy on intellectual property rights between JISC and other FE and HE funding and advisory bodies, including funding councils, and sectoral organisations, such as UUK and SCOP. This results in:*
>
> - *a lack of co-ordination in initiatives resulting in duplication of effort which can be wasteful of resources;*

- *a multiplicity of reports and guidance which are rarely uniformly publicised and distributed, and which are often targeted at different management levels within institutions, with little effective cross-referencing;*
- *no coherent medium to long-term policy pattern for institutions and subject disciplines to follow and develop their own strategies within.* **Charlesworth***,* 2005

The institutions themselves are generally failing, the report says, in:

> *provision of appropriate policies and effective guidance to their staff (especially academics) about intellectual property rights in works created in the course of their employment,* […] *This, if left unaddressed, will have a deleterious effect upon educational innovations in the digital environment, such as the development of institutional repositories;*

We include all the recommendations from that report in Appendix 3. Implementation is now needed to take such recommendations forward and to:

> *make innovative use of the intellectual property regime to ensure that information resources remain freely or inexpensively available for educational and other uses.*

The report points out the importance of:

> *the development of effective processes for the implementation of policy. Creating policies is a meaningless operation if the necessary processes are inadequate. Placing the administrative burden of 'licensing-in' and 'licensing-out' of copyright works and the concomitant expense on academic staff and departments is unrealistic and invites non-compliance.*

While copyright innovations, such as Open Source licences for software and Creative Commons licences for other works, are generally viewed as positive developments, they are not used as effectively as they could be, as the differences between licences, and their implications for dissemination and exploitation strategies, are poorly understood at both institutional and individual levels. The current mechanisms in the UK for rights registration and clearance are seen as inadequate and particularly unsuited to the academic environment.

Resources are now available to drive forward significant changes in this area – the reports and deliverables from **TrustDR** and **Rights and Rewards** being good examples. What are needed are the will and the organisational structures to make those changes happen.

> *… to fail to acknowledge those changes, and to attempt to maintain the status quo, is an unsustainable position for FE and HE institutions if they wish to continue to develop teaching, learning and research resources in the digital environment.*

Here, many of the problems have already been outlined by the Executive Summary to the HEFCE Intellectual Property Rights in elearning Programmes Report[13] of July 2006 (see Appendix 4), in particular the need for the FHE sector to:

- develop different, but complementary, IPR strategies for the different business models found in FHEIs
- ensure that publicly funded elearning materials remain freely accessible to the FHE community

and for institutions to:

- provide concise and coherent IPR policies, linked to widely disseminated explanatory material for staff and students
- simplify their legal framework for IPR relationships to enhance trust relationships
- explicitly state their ownership of learning materials created by staff and contractors
- develop and use appropriate legal agreements for inter-institutional projects
- incorporate IPR processes such as risk registers and rights registers into their basic workflow processes
- train staff appropriately for their level of involvement with IPR issues
- reward staff producing elearning materials (particularly reusable materials) to incentivise that development and to encourage sharing.

The section headings we use below – *Trust* and *Problems with process* – perhaps exemplify the core problems. Legal issues are not in themselves the sticking point; the current difficulties arise from an unwillingness to face up to the question of why FHEIs and associated organisations (JISC/HEFCE, UUK, SCOP) have been unable to construct and drive through a coherent and cohesive agenda that systematically addresses those legal issues at both a sectoral and institutional level. It is disappointing that the projects we have examined have come up against the same issues that were highlighted in commissioned reports in 2005 and 2006; and that this report in 2007 highlights again the same issues and makes similar recommendations.

[13] http://www.hefce.ac.uk/pubs/hefce/2006/06_20/

5.2 Trust

The important issue of trust and its relationship to the legal issues is touched on, but not developed fully, by TrustDR:

> *Intellectual Property Rights are currently perceived as presenting considerable difficulties to the development and uptake of both digital repositories and learning objects. The real challenge we face is how the educational sector can take advantage of the new digital media and technologies without having to pay a huge cost in terms of administration, legal fees and insurance. In this, the issue of trust is central. How can the education sector conduct its business within this environment in such a way that the various creators, publishers and consumers of intellectual property retain their trust? A social or economic system that has low levels of trust tends to have much higher running costs. In a low-trust system, expensive lawyers, contracts and insurance are used as a substitute for behavioural constraint.* **TrustDR***,* Managing Intellectual Property Rights in Digital Learning Materials (Casey, Proven and Dripps, 2007)

Rights and Rewards also highlight trust issues, with some of their respondents talking of mistrust of 'outsiders':

> *some educators may be wary of sharing their resources within and beyond their own communities of practice if there is a risk of IPR being violated (Bates et al, March 2007)*

Potential contributors want controls on use, i.e. they don't trust others to use materials appropriately without controls – especially controls on modification for resale. They speak of a need to:

> *Reassure contributors that their materials will be used in accordance to their rights, to create a level of trust with them.*

Respondents who do have trust within an institution report that willingness to share resources within an institution is high, even when sharing outside the institution is unpopular. It may be that the respondents feel that misuse of their resources within the institution is likely to be reduced by cultural factors and formal and informal institutional inhibitors (e.g. internal rules/sanctions against reuse with attribution, loss of academic 'face', or respect, for internal misusers) or it may just be that they feel someone abusing their trust within the institution/community is more likely to be found out! In such circumstances, recourse to legal devices (i.e. IPR) are less important to the individual, because IPR are too blunt a tool to use to protect the rights that really matter to the individual, not direct economic recompense, but attribution/kudos. Trust in a community is also an important component:

> *It was also clear that if peers or leaders within a subject area were contributing, then this would have an influence on contribution in the future. This was something that came up numerous times throughout this survey.*

If the leaders in our field are seen to engage with a process of sharing elearning content (especially without the need for undue emphasis on legal rights/IPR) then it seems very probable that others are more likely to follow ('Prof. X is doing this, he's a smart guy, maybe this is the thing to be doing').

However, one significant brake on enthusiasm for sharing is uncertainty about future outcomes. One respondent sums up the issues:

> *IPR is still unclear and it is difficult to know if material is available for wide access whether it will have an impact on commercialisation or publication rights in the future.*

Rights and Rewards also report an occasionally confrontational view of the relationship between staff and institution:

> *The problems lie where there is commercial value in the materials that are being produced. If they are commercially valuable then it is more likely that the University will not favourably decide to grant ownership to the creator of materials. If there does not appear to be any real commercial value in the materials then it is more likely that the University will allow the creator to freely distribute them.*

So another crucial element of building trust is to put in place structures and policies which clearly explain the likelihood of and procedures for commercialisation and fully explain where the use of alternative reward and incentive structures (as examined by Rights and Rewards, and mentioned elsewhere in this synthesis) are appropriate. We believe that the large majority of elearning material produced in FHE has low financial value but that some has very high use value. We base this on:

- very limited mention in the projects we examined of selling or licensing content. It was mainly mentioned as an institutional expectation, as yet unfulfilled, which impeded potential sharing;
- as far as we are aware, and certainly from the evidence of the projects we have examined during this study, there are very few cases of publishers competing to purchase or licence elearning materials produced in FHE;
- a variety of material (e.g. from the Open University and the MIT OpenCourseWare initiative) is freely available on the internet which undermines the potential market;
- the IOLIS project[14] (formerly the TLTP Law Courseware Consortium) demonstrates the difficulty in viably commercialising learning materials in the current environment.

[14] http://www.law.warwick.ac.uk/lcc/iolis/final.htm

Explicitly recognising this in institutional policies and guidelines, and through appropriately 'light-touch' IPR management, could increase trust and remove a potential source of conflict. TrustDR comment that technology in itself will only highlight these problems:

> *Planting technology in institutions will not engender change … as the introduction of technology highlights existing problems and makes the invisible visible … IPR is a lightning conductor for issues of: ownership, control, power, status*[15]

The lack of trust at various levels in the education sector is critical, inasmuch as it results in a fallback to legal solutions - which we have already suggested above are currently often poorly handled by management and academics/lecturers/staff for various reasons.[16] Where there are no accepted cultural/administrative etc. methods of reinforcing trust, then parties may end up resorting to legal methods, even where these stifle innovation or prevent effective reuse of low value/high utility materials.

Several of the projects report feedback that people are far more prepared to share with people they trust. This usually means people they know personally or through collaboration or reputation, but it is not a necessity to have a personal relationship. Trust can be developed within a service or a publication or a (subject or discipline) community. The journal, *Nature*, for example, would like to foster a sense of trust through reputation. A learned society or the Royal Academy would aim to do the same. So perhaps most of our recommendations could be summarised by saying that sharing will only work in an atmosphere of trust – within institutions, between colleagues, between institutions and trust in structures and services that operate within them and within which they operate. To make specific suggestions on how that trust might be created, fostered and maintained in all those different situations and then to implement them – that will be a challenge.

> *Overall we feel that sharing will take place where there is trust between those who share.*
> **WM-Share**, E-sharing … (op cit)

5.3 Problems with process and suggested solutions

It is process failures that make copyright ownership problematic; in itself copyright ownership is neither unduly complex nor an obstacle to sharing. There are interesting parallels here to data protection law which is also often used as a convenient excuse for failure to provide adequate systems and processes to manage personal data holdings – 'We can't do that, it'll breach data protection' or 'Of course, we'd like to do that, but we are unsure of the data protection rules'. To date, there has been an over-emphasis on the legal 'risks' of IPR in sharing elearning content, and a failure to carry out pragmatic risk assessments to determine the extent and acceptability of such risks. This leaves those wishing to reuse/repurpose/adapt elearning content in the dark about their position. Perversely, this may lead both to failure to reuse/repurpose/adapt no-risk/low-risk elearning content, and to the inappropriate use of high-risk material.

As TrustDR lays out in detail, there is no reason why IPR issues should prevent sharing of elearning content within institutions, or more widely amongst educational institutions, if appropriate organisational practices are in place. Unfortunately, there remains a systematic failure by educational institutions to engage with IPR in a constructive fashion in the area of elearning, and this failure usually begins at the senior management level. This is largely because:

a) educational institutions have not, until recently, seriously thought about teaching materials/elearning objects etc. in terms of IPR, except in terms of agreements such as the CLA copying and digitisation licences (licensing-in) and even there oversight of actual practices is often weak.

b) while there is a clear difference between 'pure' research projects such as those funded by the research councils (ESRC, AHRC, EPSERC etc.) and practical elearning content development funded internally by institutions[17], or by bodies such as JISC and the HEA, institutional administration tends to treat them both in a similar hands-off fashion, unless there is a clear high value IPR outcome, e.g. patents.

As a result of the lack of managerial engagement with wider IPR issues, by default, the primary IPR drivers in many universities have been the 'enterprise/commercial development' offices. As their internal brief is usually the generation/protection of income from IPR, the input of such offices has tended to be highly cautious and to skew developments towards restrictive IPR policies. The effect of allowing this restrictive, commercially oriented, approach to dominate attitudes towards IPR policy in FHE institutions has been the hampering of the development of more open attitudes amongst management and academics/lecturers/staff in areas such as sharing of elearning content. A key facet of encouraging FHEIs to engage more actively with IPR issues in elearning content will be to demonstrate to senior management that those issues belong in the mainstream of teaching activities and within the scope of everyday academic workflow. This will enable a greater commitment to sharing and liberal licensing while allowing 'enterprise/commercial development' offices to focus on more efficient and effective avenues of institutional income generation.

Key process problems which institutions need to address include:

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[15] http://www.ukoln.ac.uk/repositories/digirep/index/Legal_and_policy_issues_cluster_meeting_2006-12

[16] Though note the impact of Rights and Rewards at Loughborough University where " *the University owns copyright but will always view negotiations with the academic favourably;*[and] *when academics move institution they should, at least, leave a copy of their materials."*

[17] E.g. http://www.ucl.ac.uk/learningtechnology/eldg/

- Many institutions either don't have a clear policy on who owns the rights in materials produced by staff and students, haven't publicised it if they have, or don't adhere to it. While there might be short-term 'benefits' to such lack of clarity, e.g. it postpones the need to address a range of other FHEI IPR-related issues that creating such a policy would bring, (issues unlikely to directly affect the projects reviewed and which thus do not surface in the project reports), in the long term this uncertainty is detrimental to the reuse of elearning materials. The business case study outlined in recommendation OR1 would help address this process problem.

  Suggested solution:
  Producing, publicising and adhering to such a policy (i.e. adherence by requiring that material which is claimed in the policy to be owned by the institution is dealt with according to a coherent set of rules) would simplify many issues greatly.

- Many institutions don't advise staff properly (or indeed at all) on assignment and licensing of materials they produce, including elearning materials, research outputs, publications etc., primarily because such materials don't have a clear upfront quantifiable financial value and thus the 'commercial office' isn't interested in them.

  Suggested solutions:
  Staff should only be permitted to assign/license rights in works to third parties where they clearly own those rights (i.e. they do not belong to the institution).

  Staff should be properly educated as to why a decision to assign rights to third parties such as publishers has important consequences, and why licensing is almost always more appropriate.

  Staff should be clearly advised when the use of Creative Commons licences, institutional variants or dedication to the public domain is appropriate, and ideally institutions should provide access to a range of suitably tailored and explained pro-formas for those purposes.

- Most, if not all, institutions have no formal means of recording formal assignments of IPR or grants of licences by academics/researchers/staff to third parties except for high value items, e.g. patents.

  Suggested solution:
  A rights register (ideally simple and accessible online to institutional staff) where details of assignments of IPR and grants of licences could be collected would greatly aid in navigating the 'minefield' of IPR.

- Institutions often have no clear idea of the extent of the material that they have 'licensed-in' through means other than central services, e.g. the library, information services. Equally, institutions usually have no means of identifying where learning materials created by their employees have been reused. Attribution tools and services are not well developed. A classic example of this is multi-institutional projects which involve both use of background IPR belonging to various project institutions, and the creation of foreground IPR during the project. Even if a proper IPR agreement is reached as part of a consortium agreement, it is doubtful whether such consortium agreements are kept in a form that is readily accessible/searchable. Of course, in some cases there is simply no agreement at all.

  Suggested solution:
  Mandate clear and simple IPR agreements as part of any consortium participation, or licensing agreement, with details kept on the rights register mentioned above.

It is now more important than ever for members of further and higher education institutions to:

1. understand the implications of the ownership and management of rights in the works created and used within their institutions;
2. be able to take necessary steps to ensure that access to those works is not unnecessarily hindered simply because basic steps have not been taken to meet the requirements of intellectual property law;
3. be confident that there is an agreed and understood set of practices in their institutions for the creation, deposit and reuse/repurposing of works, such as elearning objects, that both supports and enables compliance with accepted standards of legal compliance;
4. be able to trust that the works that they make available for sharing in their institution, or across the educational sector, are used appropriately and fairly, and that the value of those works is recognised and easily, reliably and correctly attributed both by their home institution and by other educational users.

We believe that JISC can help the institutions and their members towards the goals outlined above, and we make recommendations which we think will enable this. Achieving those simple goals will provide a trust basis which will permit FHEIs to explore more innovative approaches to structuring the reuse of elearning content. For example:

… open and distance learning providers get the contributors to learning materials to sign away their rights to attribution as well as ownership. In this way the materials can then be freely repurposed by the institution without having to go through an impossible task of record keeping and permission negotiations. 'Consolidating' all the rights and ownership in this way by an institution makes the whole process manageable, the learning materials then enter the educational 'DNA' of that institution. This may well be an attractive long-term approach for mainstream education, if it is combined with a 'social contract' with the staff to maintain the original 'virgin' learning objects together with a record of attribution in a digital repository. This would be a very practical way of using the technology to address some

of the very real cultural issues involved in sharing learning materials within and between institutions. **TrustDR**, Managing Intellectual Property Rights in Digital Learning Materials (Casey, Proven and Dripps, 2007).

Whether such a 'consolidation' of rights and ownership would work as effectively in the inter-institutional sharing of elearning content as the TrustDR authors suggest is an interesting question. However, at present, it is clear that none of the four requirements above is being adequately met across the FHE sector, despite deep pockets of good practice and the development of key resources, such as the TrustDR Managing Intellectual Property Rights in Digital Learning Materials Development Pack. As such, the opportunities suggested by the TrustDR project will remain theoretical rather than practical.

In part, this is due to institutional inertia – it takes time to change culturally embedded attitudes and practices amongst management and academics, particularly when the advantages of such changes may not be immediately apparent. It is also due to a lack of firm leadership on a range of key issues, including the development of clear sectoral positions on IPR ownership between institutions and employees, and the development of effective systems of rights registration and rights clearance by government, funding councils and other sectoral organisations. Ensuring the sustainability of elearning materials requires considerable staffing and institutional buy in. As such, funded projects in this area should always seek to obtain and allocate sufficient resources and staff time to ensure that the necessary sustainability processes can be completed as an integral part of their work.

6 Organisational issues

6.1 Context

Despite a lot of money spent within UK FHE and despite the large volume of 'legacy' computer based learning resources that already exist[18], sharing of elearning content has mainly occurred in two contexts:

1. Informally, by email, exchange of CDs, capture on memory sticks, and more recently via personal, and third-party websites such as Slideshare[19]. Often this is small-scale sharing of a collaborative nature, usually of work in progress or fragments or ideas and probably happens without consideration of, or ignoring, ownership rights and permissions;
2. Within funded projects or programmes whose aim is to stimulate this activity[20]. Often this activity ceases or diminishes once the funding finishes.

Recently a number of repositories, institutional, national, subject-oriented or regional, have been set up, but awareness and use of them are not widespread. **COLOSSUS** comments on sharing that:

> *Making the learning objects available to the community was found to be less than straightforward and the extent to which partners continue to make materials available through all the channels explored will depend on the reduction of these barriers.* **COLOSSUS**, Sustainable Development Model

TrustDR emphasises the importance of cultural and organisational aspects to the success of sharing. Often the implicit '*organisational and business models*' of the technologies do not match the culture into which their proponents attempt to introduce them. We discuss these cultural factors above, but the culture is in many ways determined by the organisations. Factors which mitigate against sharing include:

- the primacy of research in many institutions and the lack of prestige associated with creating and sharing learning materials – few rewards are attached and few incentives given, whereas with research there is every incentive to share your work; [Source: Jorum interview]
- the low priority given to encouraging sharing, and in particular to establishing and publicising a workable and clear statement on the rights, ownership and permissions attached to learning materials created within an institution; [Source: staff confusion shown in the three projects surveys quoted extensively above]
- the resulting widespread confusion about ownership and fear of copyright and IPR legislation.
  The JISC strategy is good at the technical level e.g. the e-framework and commitment to open standards but the demand for these services is low because of the regulation framework within which educational organisations work … what we can do with technology is many years ahead of what the system will allow, we need to spend more time working with policy stakeholders to change the regulatory framework. **Howard Noble**, ASK project
- the view in many institutions that an institutional repository has a primarily collection and control function – good for tracking publication, activity, CVs and establishing institutional lineage or ownership. Sharing between institutions or even within an institution is not a priority [as evidenced by RepoMMan interviews and user scenarios].

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[18] The efforts of the RESET project amongst others to prove that it 'it is possible to reengineer legacy CBL resources as modern Learning Objects' should be noted here. These first steps in reclaiming legacy materials should be followed by work to discover if there is indeed an audience for these reclaimed materials and, if so, work to publicise and promote them.

[19] http://www.slideshare.net/

[20] See the 2005 'Regional Distributed eLearning Baseline Study - an overview and examples of e-learning activity in the English Regions' for a snapshot of activities http://www.jisc.ac.uk/uploaded_documents/DEL%20baseline%20final%20report%2015%20June%202005.doc

6.2 Repositories

6.2.1 Jorum

Jorum is a free online repository service for teaching and support staff in UK FHEIs. It describes its mission as *helping to build a community for the sharing, reuse and repurposing of learning and teaching materials*. It is therefore highly relevant to the purposes of this study. What follows is material from an agreed record of a lengthy interview with Jacqueline Carter and Andrew Richardson from Jorum together with information drawn from an unpublished report which Jorum kindly shared with us.

Jorum was initially set up as the sharing mechanism for the X4L programme on sharing elearning content, and the majority of sharing to date has come from projects rather than institutions (though this is slowly changing). Sharers are still mainly enthusiasts. There are usually five or six (contributing) users per institution and these will have institutional authority to approve and share materials in the name of the institution. The institutional permission process is not necessarily a guarantee of quality (though Jorum point out that a quality assurance (QA) step can be built into the workflow so institutions who want this can act in this 'guarantee' capacity should they so wish) but the process is also a major choke on supply. RSCs and HE Academy Subject Centres are also potential organisations which might contribute. Over 300 institutions have signed up as 'users', around 85 as contributors. Staff feel that Jorum's achievements are beyond measuring numbers of users – it has played an important role in getting a variety of issues (IP, third-party sourced content, need for curation and maintenance etc.) out into the open. Now these issues need to be addressed at high level within institutions.

Jorum staff tell us that few institutions have a policy in place to encourage or to help staff consider sharing of elearning materials. Many institutions are thinking about elearning content at a very senior level, but this tends to be couched in terms of VLEs etc. They are not yet thinking about the issues of curating and archiving learning content nor about repositories. In terms of readiness for *sharing* elearning content, most organisations are not ready, with any plans not yet fully thought through and still in their infancy. The landscape has multiple VLEs and Content Management Systems, disparate technologies, a variety of repository projects and approaches and only one institution that Jorum knows of which is close to a strategy for sharing elearning content. This is reinforced by the experience of the CDLOR project, which planned to conduct a *study of institutional policy and strategy on knowledge management* in this area, but dropped these plans because:

> *initial investigations demonstrated that practice in this area was not well developed.* **CDLOR**, Final Report (Milligan, 2007)

Jorum can be used instead of, or as well as, institutional repositories. It was conceived as a sort of over-arching repository for use by a limited number of institutionally mandated staff, who would upload appropriate materials to Jorum. Individual users (teachers and support staff) could then download specific materials for use in a learning and teaching context and deliver them to students through the institution's VLE or Learning Management System. It seems that this mode of operation may no longer be feasible (i.e. tolerated by users) in the era of widespread sharing of (many sorts of) content through e.g. Wikipedia[21]. Staff say that users sometimes complain that Jorum comes across as 'heavy handed', 'untrusting', laying down the law on what you can and cannot do, compared to these easy-to-use mass-audience services[22]. However, of course, users are not the only stakeholders in this issue and this is how Jorum was set up – institutions are only allowed to contribute under the terms of the Jorum licence. Any individual variation of these licence conditions, if applied to existing resources, would require the agreement of all (c.85) contributing institutions. Ultimately, Jorum believe exposure to a wider audience is key to future success, but it has up till now been thought of as a staff resource like a JISC collection. The changing nature of the learner population (widespread range geographically, age, ability and experience plus the emergence of the 'social networking generation') will mean less tolerance for complexity and bureaucracy in access/roles/authorisation/submission procedures/searching and download procedures. Simpler procedures will both encourage more users to use UK FHE-provided services and allow those users to be exposed to clear and simple advice about IPR.

Jorum staff highlight third-party content as a problem in that it may not be obvious to individual academics that third-party content is included in materials that are being adapted or transformed. Institutions also need to assess the level of risk involved in making content available. One role of Jorum has been to raise the issue of medium-term custodianship of learning materials. Jorum believe that an institutional repository attempting to deal with preservation could be 'deluged' with content which can already be in petabytes. The Jorum focus group of users, however, is unsure that elearning materials will have a long enough life to justify intensive preservation efforts.

We raised with Jorum staff the open source attitude to sharing, where materials are made available to others with the proviso that any subsequent product containing any element of these materials is also made available in the hope that materials are thus continually improved and always made available when repurposed. They responded that up till now they have regarded this as 'too complex' for learning materials. It is possible that a Creative Commons type licence, with appropriate attribution mechanisms, could enable the model of adapting or

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[21] See: http://en.wikipedia.org/wiki/Wikipedia:Upload for a simple set of upload criteria

[22] Several X4L projects mentioned the development of *local, sub-regional and regional repositories*: this is one of the dangers of JORUM being perceived as difficult. The R&R survey found that *only 4.7% wanted a regional repository of any kind* but there is a danger that they will be built because of the perception that they may be easier for the contributors and that institutions will have more control over them. But if few people want them, then it will not be surprising if few people use them.

repurposing content and then re-uploading it to the original repository – this could be a powerful incentive for people to share (i.e. a way of sharing expertise, improving and keeping materials up to date). But Jorum currently has no mechanism for republishing and/or versioning. It was felt at the time Jorum was set up that the re-layering of IP issues involved in republishing made it too complex to implement. Staff agreed that Creative Commons might be a route to address the take/give download/reupload issue. The alternative – maintaining digital rights management (DRM) information as a resource is developed and repurposed many times and perhaps disaggregated – is very complex and costly.

Staff believe that the two biggest barriers to the end use of Jorum are legal and authorisation. Legal and IP issues are discussed above. Currently Jorum staff deal with institutions which have not signed up to Athens, users and contributors who don't know their Athens username or have not heard of Athens and users and contributors who might be part of the wider academic community but not attached to an institution signed up to Athens. Shibboleth (discussed in the technical issues section below) was not mentioned during our discussion. Jorum staff recognise that there is a strong argument for ultimately allowing access to anyone[23], though there are different opinions on the speed with which it might be desirable or practical to move towards this.

We believe that the advantage to contributors of using a suitably licensed open access section of Jorum (rather than a commercial service such as Facebook) would be that:

- an appropriate licence would be applied with minimal effort from the contributor
- information and help materials on the licence would be available at Jorum
- Jorum would be acting as an 'honest broker' between contributor and user, eliminating worries about IP appropriation and punitive terms and conditions from commercial services.

Jorum staff believe that if one or two big HE institutions led the way by developing a very open policy on sharing learning & teaching materials and using Jorum as their conduit/repository, this would help transform the landscape. There is also an idea that certain 'collections' might be quality branded. They emphasised that resource curation and making materials ready for uploading (we are talking here about the necessary work *in addition* to authoring and quality control) is a significant task; any pilot institution taking such a step would probably initially need an FTE just to develop and maintain such procedures. Jorum tell us that teaching staff who want to share resources have expressed requirements currently not offered by Jorum. These include sharing with limited groups (e.g. one resource might need to be shared with staff and/or students across a small number of institutions, another might want the widest possible readership and comment). WM-Share at the University of Worcester found in their survey of teachers' attitudes that:

> *78.7% said they would prefer to be able to restrict access to certain materials they uploaded.*

6.2.2 Repositories in general

> *When asked to consider what type of repository they would be happiest to contribute to in terms of their ideal repository, a national subject-based repository was identified by 49.3%, national all subjects by 17.9% and an institutional repository was favoured by 16.0%; only 4.7% wanted a regional repository of any kind.* **Rights and Rewards**, Bates et al, 2007

Despite this ideal, Virtual Learning Environments (VLEs) are widely used as repositories. Bearing this in mind it seems sensible to:

> *Investigate the integration of LO* [learning object] *Repositories and VLEs* and *review institutional strategies for knowledge management.* **Colin Milligan**, CDLOR

It is often easier to contribute to a VLE because it is a familiar part of the user's work environment and, crucially, fewer IP (intellectual property) worries are attached because access is restricted.

> *The main thing that stops me sharing teaching material currently is that I am unclear about IP.* **Rights and Rewards**, questionnaire feedback

Jorum staff believe that end users want a subject focus and (in spite of institutions' best efforts) are motivated by sharing and showing their subject expertise around the world, not necessarily showing off their institution. If this need for subject focus is true (and it matches the thoughts of other projects we have looked at, the results of the Rights and Rewards survey and work at Intute, subject centres, and the thoughts of trainers, support staff, data librarians etc. in other surveys we have conducted) then in one member of staff's words this has 'tough' implications for all repositories. One of these would presumably be that whatever the background organisational and technical structure of the repository, the structure *visible* to users should match the users' subject view:

> *emerging repositories such as Jorum need to present a clear image if they wish to encourage participation.* **Rights and Rewards**

CDLOR make a number of recommendations including:

- *LORs should be based firmly on the needs and context of the user communities that the LORs aim to serve.*

[23] Interestingly the two senior figures (HE1 – a Pro Vice Chancellor in an HEI, and FE1 – a Director of e-Learning in an FEI) interviewed in the Jorum external user evaluation report (unpublished) could both see no *reason for restricting participation in any way, thinking that Jorum should be an open-access facility*. FE1 considers *sharing of teaching and learning materials to be important and suggested that Jorum could be a useful resource – but only if it were open to users beyond UK HE/FE and to students*.

- *LORs should be developed by multidisciplinary teams. The existing gap between user needs, and community technology dimensions can be bridged by ensuring that LORs are developed by multidisciplinary teams made up of learning technologists, pedagogy experts, software developers.*
- *Impact and added value of using LORs must be demonstrated to users.*
- *Examples of successful use of LORs should be collected and made available to users.*
- *LORs could play a useful role in supporting collaboration on development of resources (among expert resource developers as well as individual users) rather than only being used to store completed resources.*
- *LORs are product innovations, but their wider adoption and implementation will not be possible without process innovations. Examples of process innovations are changes in pedagogic processes, organisational support of innovations, mechanisms for recognitions and rewards, etc.*
- *LORs should be easy to integrate with other tools and systems, such as VLEs as well as the existing institutional collections of digital and web-based resources.* **CDLOR**, Recommendations[24]

In making further detailed recommendations for future research, CDLOR concludes with a question:

> *… why do repositories have few users? Is it only because they are in the early stages of development? Or is it because the repositories do not take into account user needs, current practice, organisational realities and cultural preferences?*

Since many very popular services are also in the early stages of development, we think it likely that the latter explanation is true: these organisational realities and the current practice and cultural preferences they generate are themselves significant obstacles. CDLOR has gone on to develop a set of guidelines for setting up, developing and maintaining learning object repositories. These are set out in the form of questions to ask yourself. The focus is on finding out about your community and users and supplying them what they need and want. The authors, concerned with poor take up and use of repositories, advise:

> *The likelihood of adoption of your repository will be increased if the repository is designed and developed by a multidisciplinary team comprised of learning designers, teachers/subject-matter experts, information specialists, and learning technologists. Rapid prototyping and iterative design models, based on thorough user needs analysis and involvement of users at each stage of design, development, implementation and evaluation of LOR will ensure that community needs are met.* **CDLOR**, Structured Guidelines for Setting up Learning Object Repositories (Margaryan et al, 2007)

Personalisation in Presentation Services: A follow-up report for JISC highlighted the contrast between the way in which people use the Internet and web-based systems in general, and the way that use of the Internet and web-based systems is built into institutional processes. This perspective is emphasised in some of the projects reviewed for this synthesis. Reflecting on the SPIRE project, David White of Oxford University says:

> *The overall theme is that of sharing: materials, ideas, knowledge, friends, contacts. Further research should be undertaken to gain a better insight into the motivations of those using the services. I would argue that educational institutions no longer lead the way in the provision or usage of collaborative technologies and as such they should look to engage with web based services that may well have a population not solely made up with students or staff from their own institution. The initial reaction should not be to simply duplicate these services 'in house' without serious consideration to the implications.*
>
> *Another overarching principle that occurs across these services is the notion of a flow or flux of information and ideas. The majority of current elearning works with static content in tandem with collaborative or discursive spaces such as forums. A challenge for elearning in the near future will be in finding ways in which it can engage in the flow of knowledge that these services provide whilst still working within an identifiable and educationally assessable structure.*

Small scale, friendly and customisable as many of the web-based services on the Internet that support sharing may feel, they are typically operated at an incomparably larger scale than that of even the very largest FHE institution or JISC service, with large teams of able developers, substantial access to capital and, in some cases, massive supporting infrastructure.

PROWE is primarily about personal repositories but their work is interesting for repositories in general, both because it gives insights into user preferences and behaviour and also because it candidly admits that the environment was changing so quickly during the course of the project that participants changed their views of what approaches should be adopted and so the project had to be nimble enough to adapt.

The project worked with groups of tutors at the Open University (OU) and University of Leicester, asking them about their practice and preferences:

> *The tutors involved in the focus groups all expressed the wish for more interaction with other tutors and for more sharing of resources. Many reported a lack of time for collaborative activity and, equally, a concern over ownership issues for shared materials. Likewise, who would hold copyright for original, reused, reversioned or collaboratively authored materials? In particular, an issue arose over the ability to retain original materials whilst also offering them up for others to develop in new directions.* […]

[24] http://www.academy.gcal.ac.uk/cdlor/documents/CDLOR_Final_Recommendations_v1p0_000.pdf

> *There was a great deal of optimism about the possibility of developing a shared resource or repository but,* […] *in order to become an integral part of AL* [Associate Lecturers] *life, using any new environment must become an effortless and integral part of the normal work of being a tutor and it must better serve existing needs, or real needs that are not yet being met.* **PROWE**, Understanding the OU User Perspective (Hewling, 2006)

Although the PROWE project is about sharing between tutors and building tutor networks, for the tutors sharing with students is as important as sharing amongst themselves. A system which had multiple levels of access could allow for sharing with a range of groups; this would eliminate the need for tutors to store materials in different locations in order to share with different groups.

PROWE report few tutors sharing materials and not many even reusing their own materials between their roles in different institutions, often due to worries about copyright. A large majority have never used a repository, with a significant number not having heard of the term (in relation to learning materials) and others using or assuming that the VLE will fulfil the storage function. A large majority wish to share but some are concerned about the quality of their own resources and how they will be judged. They spend little time organising their own resources. When looking for resources to use they want level information and a search by keyword facility. Several also mention an Amazon-type star rating and cross-referencing system.

TrustDR conclude that institutional repositories:

- *need to be supported by top-down policy directives to be sustainable (as does elearning in general) and as part of the institutional teaching and learning policy*
- *require a multidisciplinary approach with librarians in the lead*

and that

- *the market value of the content of many repositories is likely to be very low*
- *utility value of the content may be high.*

If these latter two points are true for repositories in general then we believe that spending technical and organisational effort on DRM and complex authentication and authorisation procedures will be counter-productive. Where market value is low and utility value high then the best thing to do is to publish under appropriate licence, make the content properly findable and allow and encourage the users to come to the content. Of course this requires a willingness on the part of staff to share their resources and we note that an important factor in this is staff feeling an element of control; we discuss this elsewhere.

If content is not easily adapted and re-uploaded, then how long will that content remain valuable?

> *Of course what will happen is that the currency of these materials, it seems to me, diminishes quickly. They need updating frequently to keep them fresh and working properly. So it will be very, very interesting to see how that works, whether people will be able to maintain their resources at the current high level of standard.* **DialogPlus**, participant

To make a repository infrastructure work, in our opinion, the repositories would have to take a leap towards being more useful, more popular and more usable. They would need:

- to match in organisational structure what people want, and this seems to be a visible subject-community-based organisation (whatever the underlying hosting organisation is);
- efficient, open, comprehensive search and retrieve facilities;
- to link effectively with networked community/Web 2.0 services, to enable coherent services, transactions and workflow between them;
- the ability for users to easily rate and review resources providing both assessment and reassurance for human users and metadata for search procedures;
- the ability to provide or use information produced by page-ranking algorithms to rank search results (but use existing, not attempt to reinvent);
- the ability for users to download, add and amend and re-upload, providing a development path and incentives for the original author to share;
- the development and promotion of a suitable liberal licence which reassures content creators about recognition issues, and the hosting of that licence at the repository so that it is easy for staff to upload materials which will then be made available using the licence as the default;
- encouragement and a permissive environment for academics to directly share their own small objects, images, files and/or fragments in an informal manner;
- incentives for repurposing legacy materials (e.g. the **RESET** project).

6.3 Funding, policy and implementation

> *Organisational and national policy should promote a culture of sharing and support this through collecting good practice.* ***Colin Milligan****,* CDLOR

A significant number of the projects we examined had shared materials within the projects but displayed no evidence of wider engagement and wider applicability of their work. Even amongst those who had strived for this there is recognition of a subtle difference between demonstrating reuse and building reuse into the fabric of development. It is best exemplified by a thoughtful contribution to one of the evaluation surveys we encountered:

> *We haven't significantly enough demonstrated reuse. I'm worried that we have produced learning materials, not reusable learning materials. The answer the* [subject experts] *give to that is we've taken reuse to the most serious level, we've actually got the teacher from School X teaching the subject, that's reuse rather than redoing it ourselves. In a way that's very impressive, it shows the depth of the partnership, the trust that's built up in the partnership, but it doesn't show one of the outcomes that JISC wanted to see which is how do you build reusable activities* [for general use].

Several projects mention the desirability of having heterogeneous teams with mixed multidisciplinary subject specialists and technical and library staff all involved:

> *More work demonstrating the value of cross discipline teams - not only by subject, NB DIDET is collaboration of academic and academic-related staff with non-teaching staff becoming involved in the classroom. More promotion/demonstration of this kind of collaboration would be useful.*
> **Caroline Breslin**, DIDET

WM-Share compare and contrast institutions at different stages of considering and implementing sharing elearning content. *Type 1* institutions are not yet sharing content, but are considering doing so; they typically have a wide range of uses of IT, have a VLE for delivering some course content and make some use of external resources or materials. They have identified advantages to being able to share content through a repository but have reservations due to the large number of problems they anticipate. *Type 2* institutions have resolved most of the issues that prevent engagement with repositories and sharing content and have centralised support to encourage more activity; their goal is to implement repositories and extend the use made of them. Some of the problematic considerations upon which the Type 1 institutions focus are technical - prior negative experience of technologies, particularly the use of VLEs. But for many it is also uncertainty about IPR considerations. WM-Share then pose the question, what is the key difference between the practices that these two types of institutions have adopted to get to where they are? They answer:

> *Institutions that are not yet sharing content, but are considering doing so (Type 1), focus upon the problematic nature of shared content as the main barrier to change. Main drivers are extrinsic motivations. Institutions that have instances of sharing content (Type 2) identify the internal mechanisms for change, driven by key decision-makers within the institution, as their most important success factor.* […] *For institutions to make the transition from Type 1 to Type 2, therefore, the change in focus needs to be to embed procedures within the organisation to promote the sharing of content.* **WM-Share**, Bell and Rothery

Two of the outputs of TrustDR, mentioned in the Legal section above (*Managing Intellectual Property Rights in Digital Learning Materials: A development pack for institutional repositories* and *After the Deluge: Navigating IPR policy in teaching and learning materials*), deal directly with the above issues. They are relevant, impressive and effective syntheses of both the difficulties that IPR can cause FHE and the pragmatic solutions that have been suggested for dealing with those difficulties. A key difficulty with JISC deliverables of this kind is that they are may not be given the type of exposure that they merit. We recommend that these, together with the sensible and viable system set out in *Proposed rights solution: Final report* (Loddington et al, 2006) from Rights and Rewards, are actively promoted and maintained and that their use by institutions is monitored by JISC and is strongly recommended through UUK, SCOP and other appropriate bodies.

6.4 IP and copyright within the organisation

> *… the hostile legal climate created by commercial interests and their lobby groups is having a negative effect on creativity in the commercial and public sectors alike. In the elearning arena of learning objects Griffith (2005b) has described the negative 'chilling effects' that copyright law is having on efforts at reuse in learning materials*.
> **TrustDR**, After the Deluge (Dripps, Casey and Proven, 2006)

TrustDR suggest developing an active, institutionally integrated stance. They also suggest significant national infrastructure and support is required. We have discussed the feedback from projects on legal and IP issues above. The implication for the *Organisation* is that all institutions and funding bodies have a responsibility to move quickly towards establishing clear policies in this area, policies which are familiar to staff, well understood by them and which are formulated with their support. The policies need to be easily implemented and their full implications spelt out clearly. They also need to be embedded in processes and tools.

7 Technology issues

7.1 Context

The technology which underpins the sharing of elearning content is constantly evolving. The domain has developed rapidly during the lifespan of the projects under consideration and the rate of change shows no signs of slowing. In this section we review the experience of the projects under headings representing some of the key functional areas which are required in order for content to be shared. We also comment on technological trends and on relevant experiences and findings from outside the UK FHE domain.

7.2 Current awareness

Feeds (RSS and Atom[25]) and email notifications will be an important component of sharing elearning content, allowing users and potential users to be notified of changes/new content etc. These services were infrequently mentioned in the projects we examined, perhaps because they are often invisible or taken for granted. Nevertheless, as we have seen from SPIRE's recommendation of 'push' technologies, they are an essential element if organisations, institutions or services wish to alert their potential audience to new or newly-shared elearning content. Although not directly addressed by any of the projects under review, RSS/Atom is also often used as a transport mechanism for the syndication of search results using the OpenSearch specification. OpenSearch is widely supported and is integrated with Internet Explorer 7 and Firefox 2.0 and may become of increasing interest to repository owners as repositories grow and mature.

Terms such as 'awareness', 'syndication' and 'alerting' are often used interchangeably, although in practice they are subtly different. For example, in order to ensure that a human agent is *alerted*, email may prove a more effective mechanism than RSS/Atom (and is indeed the method chosen by GoogleAlerts[26]). In practice, there are technical solutions available to translate RSS into email alerts, but to be effective the translation service must know what it has sent to each user so that repeated identical alerting emails are not sent.

7.3 Metadata

7.3.1 What do people want to do?

While it is generally considered as primarily a technical issue, consideration of metadata, how to use it and how to create it has very important cultural and organisational elements as well as far-reaching economic, policy and strategic implications. It can be intimidating and overwhelming to encounter the considerable complexity of metadata schema, their representations and crosswalks and the equal complexity of the close semantic matching necessary to exchange data sets between different systems and the heated and detailed arguments over metadata implementation for archiving, classification, search and retrieval. Whilst recognising that metadata is created for a number of different purposes, end user requirements of resource discovery metadata are straightforward. People want to find stuff using search terms; preferably the right stuff.

7.3.2 Views on metadata creation

The view taken by several projects we have looked at and articulated most coherently by TrustDR and Jorum in particular, is that, if we are to create useful repositories of learning content then there will be a continuing and substantial need for expert human metadata creation for the foreseeable future:

> *We take a very sceptical view of claims that are made by some researchers for the ability to do away completely with human labour in regard to metadata creation and management – an essential ingredient for long-term repository sustainability.* **TrustDR**, Development Pack

> *... the increased application of systems and process to automate metadata will not result – in the foreseeable future at least – in the obsolescence of the human in the metadata creation process. Whereas a computer can read, say, an IMS Manifest file and record all references of technical formats much faster than a human, a skilled cataloguer is able to make judgements on the practical application of the described resource within a learning environment in ways a computer cannot.* […] *The ideal situation is the two approaches to metadata creation working in tandem, with as much automated as possible to allow cataloguers to spend greater time on creation of metadata that cannot reasonably be expected to be automated.* **Jorum**, report on automated metadata (Baird et al, 2006)

Another view of the limitations of human created metadata, as described by Doctorow[27] (with reference to descriptive metadata) and Google[28] referring to class names, elements, attributes and related metadata, is supported by Erik Duval's experience:

> *I spent years trying to evangelize on the merits of manually adding metadata to learning resources. I would explain how important it was that people would describe their resources in rich detail - a 'small investment' that would help future generations to find and re-use the resources. After many years of doing this, I realised that this would never scale, that it is maybe a small effort but a tedious one, that the metadata were often of questionable quality,* […] *in short, that this was not the right approach. That led me to the idea that 'electronic forms must die', which was the start of our work on automated metadata generation, an idea that now is proving very fruitful to us*[29]*.*

This experience, together with the ease of use and flexibility of current folksonomy-oriented projects and services, is increasingly being reflected in user attitudes:

> *The PROWE project has taken place during a time of great change in users' attitudes to systems and content, and as a personal repository project PROWE has felt the effects of this sea change to a considerable degree.*

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[25] see http://www.atomenabled.org/ and http://en.wikipedia.org/wiki/RSS_(file_format)
[26] see http://www.google.com/alerts
[27] http://www.well.com/~doctorow/metacrap.htm
[28] http://code.google.com/webstats/index.html
[29] http://ariadne.cs.kuleuven.ac.be/wordpress/eduval/

> *By the middle of the project the tutors' attitudes to metadata had changed quite radically. The increased popularity and consciousness of systems like flickr and del.icio.us, meant that a significant number of the tutors taking part in the project no longer felt the initial approach to personal repositories metadata was appropriate. The Open University tutors were no longer happy with systems dictating to them what information they should provide and wanted to be able to define their own parameters.* **PROWE,** Metadata Report (Whitelaw, 2007)

PROWE found that tutors at both the Open University and the University of Leicester had very little interest in and were quite resistant to adding more than minimal descriptive metadata for resources they deposited into repositories:

> *For up-loaded resources a title, description and a keyword field would be the acceptable maximum tutors would be happy to add, any other data would need to be generated through automation and extraction from other university systems. The Open University tutors were inclined towards being sole managers of that content, through the use of folksonomies. Although they could see the flaws and drawbacks that come with folksonomies: lack of definition between resources spelt the same but with different meaning, spelling mistakes, boundary-less, etc..., these flaws were also seen as part of folksonomies' strengths.* […]
>
> *The theme of serendipity ran through many of the interviews, the idea that you stumble across resources, people, ideas that you would never have usually have searched for by following a trail of tags. This is one of the ideas that seems to provoke the most interest and excitement.*
>
> *Many of the tutorial staff no longer felt that quality assurance of the resources by library staff was appropriate. As this was a personal repository and community system they wanted it to be built upon less formal metadata structures and processes. They wanted to police errors and inconstancies in the metadata and folksonomy themselves as a community, as is best practice in this area.* **PROWE**, Metadata Report (Whitelaw, 2007)

Clearly here the emphasis is on *personal* repository. Nevertheless it is a signal of preference that all repository builders might heed. The tutors are unwilling to complete detailed metadata for resources and the project expressed its wish to comply with the tutor community's wishes by using a much-reduced metadata profile in the OU. In contrast is the tutors' attitude to personal information:

> *Although tutors disliked formalised resource description metadata, nearly all tutors expressed an interest in user profiles. One of the primary metadata findings of the PROWE project has been that tutors are very happy to input personal metadata about themselves within the wiki, and are not at all phased by being presented with a very large number of fields, as long as they don't feel they are being forced into providing the information.* […] *Tutors went back and edited their profiles multiple times, frequently being inspired by the profiles of other tutors to augment their own. We found that many of the tutors made decisions and judgements about what resources to read based on their knowledge of the author, so they already have 'real life communities' and they felt that user profiles would enable them to extend those communities.* […] *The profiles were where the tutors could explore, not only common interests and serendipitous discovery of expertise but also, how they judged the validity of resources.* **PROWE**, Metadata Report (Whitelaw, 2007)

7.3.3 Authoritative vs. non-authoritative metadata

Structured metadata schemas such as IEEE LOM[30] typically rely on the use of controlled vocabularies or term lists to ensure consistency of classification between metadata authors. This consistency is seen as important to optimising information retrieval. However, these vocabularies may represent a barrier to uptake if they are seen as obscure or complex by end users (particularly users familiar with 'looser' tagging structures such as those used in del.ico.us). The issue of engaging the community and winning 'hearts and minds' was at the heart of the EERN project description. They felt that, on being presented with unfamiliar terminology:

> *practitioners may not decide to go ahead with the classification of a learning resource and drop the task.*

Clearly an important technical consideration to engagement is to present the user with a familiar vocabulary to help them in their task of classifying the resource. This is where the idea of a 'folksonomy' appears to fit most readily into the technical framework. We can perhaps interchange the general idea of 'folksonomy' with the description 'most appropriate view for the users' to produce less of a barrier to engagement. This is an area where the technical solution moves towards personalisation. We must remember that the true definition of a folksonomy is a system or collection of informal tags which is constantly changing. However, if we stretch the definition and cluster user-defined terms around the structure of a classification 'backbone' we can perhaps have the best of both worlds.

7.3.4 Ordering on the way out

David Weinberger in his blog, in the recently published book *Everything is Miscellaneous*[31] and in a talk[32] given at Google on 10/5/2007 points out there is now no one right way of ordering the world; furthermore, that whereas physical things (books, stuffed animals, tools, CDs, journal articles) have to be put somewhere logical - both in space and in a physical catalogue - so that you can find either them or the record associated with them, this is not

[30] http://www.ieeeltsc.org/working-groups/wg12LOM/lomDescription
[31] http://isbn.nu/0805080430
[32] http://video.google.com/googleplayer.swf?docId=2159021324062223592&hl=en-AU

the case for digital things, which can be anywhere, and whose classification is much less relevant, provided you can search for and find them. His thesis is that the fundamental change that is taking place is the 'externalisation of meaning', by which he means that:

1. it is now simpler for citizens to organise or search digital things as they themselves decide, rather than for these things to be classified for them;
2. the links between digital things, and the tags and other attributes that people give them, create a rich layer of meaning that can be drawn upon by others;
3. the difference between data and metadata is disappearing (except to the extent that metadata is 'what you know' and data is 'what you are looking for';
4. through Wikipedia and blogs and similar there is an increasingly public negotiation of knowledge, in which experts are decreasingly the arbiters of authority.

Erik Duval spells out the implications of Weinberger's approach:

> *… we should no longer worry too much about ordering things 'on the way in', for instance trying to put them in some specific place in a classification structure. Rather, we should make sure they accumulate rich metadata (including attention metadata)* […]*Then we can provide order 'on the way out', in response to specific user interactions.* […] *it has profound implications for how we deal with information.*[…] *in a way, the web illustrates the principle. When you create a new page, it gets organized as people start referring to it, not when you publish it!*[33]

So services need to ensure that their descriptions of resources are not a barrier to finding; merging controlled vocabularies and folksonomies becomes important. Especially when the object is not itself a long piece of free text, then other measures such as frequency of correlation and all the measures used by search engines come into play.

7.3.5 Our conclusions on metadata

Appropriate management of learning materials and building the trust needed for sharing will require administrative, access, rights and preservation metadata. While in principle they can all be generated automatically, work needs to be done to provide or integrate tools to do this. The JISC community will increasingly be using services which order things 'on the way out' according to approbation criteria and attention metadata which have nothing to do with catalogued descriptive metadata. There will be a need for tools to automate creation of metadata in these areas too, supplying data to, and pulling it from, Web 2.0 type services.

We believe that there will be a role for information professionals creating high quality metadata for the foreseeable future, but that this role should be strictly limited by a sensible discussion about the value of the resources being described and the cost of the process. All projects committed to descriptive metadata creation soon find out the expense of the process and the futility of trying to compel authors to create metadata:

> *Workflow for successful metadata collection. We are working on this as it is a huge issue for us - large ongoing time investment required for this. Making metadata mandatory results in useless entries (e.g. dskjgdsjhgjhsgd), lack of funding for long term information specialist, etc.* **Caroline Breslin**, DIDET

The prime means of finding anything digital are search engines (for all audiences, including academic, specialist, knowledgeable etc.) and therefore much text-rich data is its own metadata, and much effort from services such as repositories should be focussed on allowing search engines to accurately locate (not necessarily deliver, but definitely locate) any resource in a repository; once located any rich metadata (and tags) may be used to present the user with useful information and sticky links such as 'more like this'. Manually adding rich metadata to resources can be highly desirable but can only feasibly be done on a small number of resources. The overhead should be proportionate to the value (however you judge it – and we are not making that judgement).

The need/cost effectiveness for humans to create descriptive metadata:

Plenty of intrinsic semantic content – e.g. plenty of text, attribution info, heading structure	No or next to no metadata needed	Some metadata may be needed
Limited intrinsic semantic conten – e.g. image, audio, video	Some metadata may be needed	Metadata will be needed and probably cost effective
Type of data	**Low value objects**	**High value objects**

7.4 Repository interfaces

7.4.1 Publishing items or collections into a repository

There is currently no accepted 'standard' for a publication/deposit syntax, however the need for standardisation has been identified. All repositories expose an API to facilitate publication and deposit but this is not subject to the same standardisation as has become accepted in the search communities. There is currently a technology

[33] http://ariadne.cs.kuleuven.ac.be/wordpress/eduval/

evaluation and proposal based around the requirements of a publication API[34], the SWORD project[35] is taking this forward. The OAI-ORE (object re-use and exchange) project[36], funded by the Mellon foundation in the USA, is developing RDF based specifications "that allow distributed repositories to exchange information about their constituent digital objects. These specifications will include approaches for representing digital objects and repository services that facilitate access and ingest of these representations. The specifications will enable a new generation of cross-repository services that leverage the intrinsic value of digital objects beyond the borders of hosting repositories". The outputs of this initiative will clearly have relevance to a wide range of repository functions, including publication.

7.4.2 Harvesting content and/or metadata

The most widely used protocol for harvesting elearning metadata into repositories is OAI-PMH, an XML-based protocol for metadata information retrieval. It is a synchronous messaging protocol, transmitted over http, and uses a fixed set of protocol requests and parameters[37]. Results are returned in XML and conform to defined Schema XSDs, which constrain the result format. However, this constraint does not extend down to the record level and record formats are generally agreed between clients and data providers, depending upon the community of practice or domain. The specification mandates that all targets must support the OAI DC format. OAI is a complete service, messaging, transport and data binding model and can be combined with a separate authentication and authorisation model defined through an application profile or other specification. One of the original goals of OAI-PMH was to promote a relatively simple model to facilitate reuse and replication of metadata, as complexity was seen as a barrier to implementation. Despite the apparent simplicity of the standard, it is not a simple process to set up harvest instructions and then to maintain an automated management system to support ongoing harvest updates. As the PerX project found:

> […] *metadata providers rarely follow the OAI-PMH standards and recommendations in full, and also that commercial content providers often have little interest in OAI-PMH* […] *much of the metadata produced by data providers contains errors and omissions which can cause problems for service providers, or, at worst* [...] *make the metadata unusable. Largely because of this, and despite some time being spent on various attempts, it proved impossible to automate the reharvesting process to any degree.* **PerX**, Final Report (MacLeod, 2007)

It is clear from the difficulties associated with a relatively 'simple' protocol that claiming adherence to a standard is no guarantee of performance. The suitability of any software solution is highly dependent on the quality of the implementation. These findings have been echoed within the cultural sector in the Museums, Libraries and Archives Council (MLA)-funded Peoples' Network *Discover* system. This project decided to utilise OAI-PMH because its simplicity was less of a barrier to implementation, but the problems associated with simply performing an initial harvest to replicate the data were beyond what would have reasonably have been expected. The OAI *static repository* specification – which allows publishers to implement an OAI target simply by creating a static XML data file – has been successfully used for small-scale collections (e.g. in the JISC Stargate[38] project), but is not scalable beyond collections of much more than 5000 records.

OAI-PMH does not include an authentication model. Although it is possible to apply any http-based authentication mechanism to a profile of OAI-PMH, the **Fred** project have gone one step further and proposed a consistent approach based on a SUM for 'authenticated harvest'[39]. The OAI specification is a specification for exchanging and replication of metadata only. When it comes to sharing of general content it is obvious that there is a need to address the sharing and replication of content as well as metadata. Work at Los Alamos National Laboratory (LANL) and elsewhere has demonstrated the feasibility of embedding complex objects within OAI-PMH messages to enable transfer of digital assets as well as metadata (see, for example, http://www.dlib.org/dlib/june05/bekaert/06bekaert.html) and demonstration versions of software which implements this have been distributed alongside the Apache mod-oai module[40](although this is currently still alpha release software). It is likely that, in the publishing and scholarly communication communities at least, much of this effort will be subsumed by the OAI-ORE initiative (op cit). However, there is also a proposal from KU Leuven and EUN through the CEN/ISSS WS/LT to investigate the same issue but solely within the elearning sector.

7.4.3 Resource discovery

We have argued that once a user has located a suitable resource (either via a search engine or the web front end of a repository), then if there is, within the repository, any rich and structured metadata that has been used to describe this resource, it can be used to assist the user by offering faceted refinement, alternatives based on classification structures etc. If all these resources are available on the 'open web' then they will be findable using search engines and also be available for tagging through social bookmarking sites such as del.icio.us (although whether their users will actually want to do this is a different matter).

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[34] see http://www.ukoln.ac.uk/repositories/digirep/index/Deposit_API
[35] http://www.ukoln.ac.uk/repositories/digirep/index/SWORD
[36] see http://www.openarchives.org/ore/
[37] http://www.openarchives.org/OAI/openarchivesprotocol.html
[38] see http://www.jisc.ac.uk/whatwedo/programmes/programme_pals2/project_stargate.aspx
[39] see http://www.e-framework.org/SUMs/SUMsRegistry/MAMSAuthenticatedHarvest/tabid/860/Default.aspx
[40] see http://www.modoai.org/

The question of how resources in a repository should be made searchable within a federated environment is a rather different one. The parameters of what constitutes successfully creating a searchable service are changing and developing. However, a general definition of different search specifications can be broadly categorised as follows:

1. Open specifications that are designed to be repository agnostic and thus provide access to a wide range of repository data
2. Open specifications that provide proprietary access to a single repository of data which is useful due to the breadth of the content of such a repository
3. Open specifications that provide proprietary access to families of repositories, which are useful mainly due to the number of repositories implementing the specification.

The main technologies involved in federated searching within the educational arena include SRW (Search/Retrieve Web Service), SRU (Search/Retrieve via URL), Z39.50, SQI and OKI OSID. Although it is now a little old, a good overview of these different approaches to searching is provided at the Cordra site[41].

The **PerX** project investigated federated resource discovery across a range of data sources and concluded:

> *It is possible to embed cross-search functionality within a VLE by utilising open source and open standard approaches.* **PerX**, Final Report (MacLeod, 2007)

However, they acknowledge that:

> *persuading publishers to adopt standardised interoperable approaches such as OAI-PMH, in addition to their well established means of metadata exchange with the large search engines, is an uphill struggle.*

7.4.4 Peer to peer networking

The progress of the SPIRE project is interesting, raising technical, cultural and organisational issues highly relevant to repository development. SPIRE took as their starting point research from the Penn State University **LionShare**[42] project, which found that academics were wary of uploading:

> *materials into digital repositories because they had little or no control over who could then view/use that material. The general trend discovered was that academics felt that their material was either of too poor quality to upload and would reflect badly on them or was of such a high standard that they were reluctant to simply 'give it away'.* **SPIRE**, Change Report (White, 2006)

… and yet the SPIRE researchers noted the same enthusiasm for sharing *informally* that CDLOR encountered. They decided to reject the notion of monolithic repositories and instead pursue file sharing in a peer to peer (P2P) environment where academics stayed in control of their information by retaining it on their own hard drives and only sharing it with people of whom they have approved. However, it proved to be impossible to replicate the LionShare implementation within another institutional system: not only were there a number of serious technical hurdles, some of which were insuperable within the project's time and material resources, but the project team came increasingly to believe that it would be a fruitless effort to attempt to combine the high levels of security necessary to reassure academics and their institutions with the flexible paradigm of P2P:

> *The combination of high security and a notionally 'disruptive' system such as P2P potentially negates the aspects of the P2P paradigm that make it popular on the web.* **SPIRE**, Change Report (White, 2006)

And they concluded that:

> *The research undertaken by the SPIRE project would suggest that the dynamic collaborative sharing of materials is best done with push rather than pull technologies.*

It seems that the P2P paradigm does not yet offer an immediate alternative to repositories as it does not allow the high and granular security required (or perceived to be required) by academics.

SPIRE thus dramatically changed tack, sloughing off the skin of a software implementation project to take on the role of a cultural study and conducting interesting research (which we mention and quote above)

> *into the methods and motivations for sharing and collaboration by attempting to discover which technologies have been appropriated by academics and students for these purposes.*

7.5 Authentication and access control

JISC has a long-term track record of interest in this area. When it became clear that the existing Athens system of authentication was not likely to meet future needs, it initiated the AAA (authentication, authorisation and accounting) programme to investigate issues and potential solutions in this area across domains including eLearning, eResearch and Digital Libraries. Subsequent to that programme, the UK Access Management Federation for Education and Research has been set up. This federation, supported by JISC, BECTA and operated by JANET (UK), aims to provide a single solution for controlling access to online resources based on standards-based Shibboleth software. Shibboleth is a federated system of access control based on the exchange

[41] see http://cordra.net/docs/info/searchspecs/v1p00/info-searchspecs-v1p00.php
[42] http://lionshare.psu.edu/

of attributes between *identity providers* and *service providers*. It emerged from the US NSF-funded internet2 programme and has considerable uptake in the US HE sector, although in the wider environment, approaches based on OpenID appear to be gaining popularity, particularly as this standard is implemented as part of Microsoft CardSpace (a number of organisations have reported problems deploying Shibboleth software within a Microsoft environment).

Although many HEIs are beginning to adopt, or at least experiment with, Shibboleth, it has yet to become universally adopted across the full range of institutional systems. As one of the projects pointed out:

> *Shibboleth access to VLEs in universities is still not commonplace, making true sharing of courses difficult.* **Hugh Davis**, DialogPLUS

On the other hand, the philosophy of eventually adopting a common system appears to be justified:

> […] *sharing learning objects between institutions has some surprising similarities to e-science and grid computing where data is shared across institutional boundaries and adapted or used to produce new materials.* […] *There are currently a variety of ad hoc 'local' systems in use in addition to Athens, and a common way forward needs to be found to allow a fully embedded national infrastructure, as is the case in elearning. Common issues include; levels of authentication, granularity of access; delegation and associated roles; attributes (core and extended); weak versus strong security for different resources; personal versus institutional identities etc.* […] *These are all issues, which equally affect learning material – particularly the institutional management of records and information that will be required for Shibboleth to work (in our view a major challenge). It will be useful to cross-reference future work in both areas.* **TrustDR**, After the Deluge (Dripps, Casey and Proven, 2006)

Other projects have adopted approaches that can be extended to include a Shibboleth-based authentication and authorisation system:

> *Sharing these resources not only improves efficiency but also has the potential for teachers to reflect and improve on their practice. A less tangible benefit arises from a greater sense of community that can result from sharing and critically evaluating each others' learning resources. DELTA adopts a web service architecture. However DELTA needs to be extended to create EERN through its integration with VLE's, authoring tools, and an authentication system (Shibboleth).* **EERN**, project aims

EERN sought to have partner institutions use Shibboleth as a way of enabling people in any institution in the consortium to authenticate in such a way as to access resources held by any consortium member. Various technical issues arose, for example Institution A's WebCT version was not Shibboleth enabled.

> *Finally the use of Shibboleth requires support from the Institution's IS departments, and this support was forthcoming in most cases. However, it should be noted making Shibboleth work proved challenging.*
>
> *Deploying Shibboleth was not simple, partly due to the poor quality of the given installation guides at the time. It was therefore necessary to write our own EERN specific installation guide* […] *which was successfully used by the partners.* **EERN**, Final Report (Fowler, 2006)

Given the longer period of exposure to Shibboleth in the USA, it is not surprising that the DART project, involving Columbia University, was one which did not report any implementation issues with Shibboleth and was able demonstrate its effectiveness (albeit in a limited context):

> *While, on the one hand, the library has been built to invite interoperation, we also have restricted access to some materials, currently for licensing or archival policy reasons. In archival cases we normally refer readers to the original source material (simple link). To accommodate other restrictions we have surrounded portions of the collection within an area restricted by the Internet2 'Shibboleth' software. Within the current project, this restriction applies to materials available only to Columbia University and the London School of Economics. This technical facility had been in place since December 2004, and it has enabled students at the LSE to reach restricted materials held at Columbia. We feel this technology scales well and offers the most flexible opportunities for a publication with a wide range of both audiences and content providers.* **DART**, Final Report, July 2006

It is worth noting that 'access control' systems such as Shibboleth may not fulfil all content creators' requirements with respect to usage tracking. A typical repository with access control in place will only verify that a user is authorised to access a piece of material but will not track its subsequent use. There are anecdotal reports that concerns about lack of control over, or the ability to track, subsequent use may inhibit some content creators from making their materials available for reuse. As far as we are aware, none of the projects tackled this issue in any detail. Tracking subsequent use should be an element in any research work on attribution.

7.6 Web 2.0

The rapid growth in Web 2.0 technologies and technologies in general has started to bring with it a more generic problem: 'How can I ensure that my project is not obsolete before I have started it?' Projects which become involved in emerging technologic trends always run this risk and the growth in rapid development exacerbates the

problem. In 'Web 2.0 for Content for Learning and Teaching in Higher Education'[43], Franklin and van Harmelen recommend:

> *JISC should consider funding projects or case studies that look at different methods for integrating Web 2.0 into the overall university information and information technology environment while retaining flexibility of use across teaching, learning, administration and other areas of university.*

An important caveat would always be that any projects that look at this area must themselves be relatively lightweight and flexible otherwise they run the risk of being irrelevant before they start. There is also a danger of reinventing such services, spending substantial time on software development and reaping little end user benefit. For this reason we would advise that such integration uses existing technologies/services/protocols.

7.6.1 'Social software'

Blogs, wikis, social tagging and media sharing are now part of the technological landscape. They allow users not only to share data but also to build a community around common areas of interest as part of the sharing process. It is quite a leap, however, to assume that the growth in this phenomenon automatically makes it applicable to the sharing of elearning content. Just because there is effectively a shared leisure time activity involving creating a social network of like-minded people, the assumption should not be made that there is the same need or indeed desire to apply this to the learning environment. Attempts to present the sharing of learning objects as equivalent to a 'MySpace' environment (for example) are flawed in the scope of the resource comparison. It may be that a fast, agile method for sharing smaller 'assets' (e.g. images, audio) which are suitable building blocks for larger objects has more of a crossover.

Franklin and van Harmelen also state:

> *Web 2.0 will have profound implications for learners and teachers in formal, informal, work-based and lifelong education. Web 2.0 will affect how universities go about the business of education, from learning, teaching and assessment, through contact with school communities, widening participation, interfacing with industry, and maintaining contact with alumni. However, it would be a mistake to consider Web 2.0 as the sole driver of these changes; instead Web 2.0 is just one part of the HE ecosystem. Other drivers include, for example, pressures to greater efficiency, changes in student population, and ongoing emphasis on better learning and teaching methods.*

In fact, Web 2.0 in this context is hard to pin down. It is not the technology itself but the increased user engagement and participation it implies that will have profound effects. Wikipedia is one very clear example of social software which has already challenged the library tradition that reference sources need to be authoritative. Wikis have become embedded in the way that things are collaboratively described and managed. The same report states that wikis:

> *are particularly suited to the incremental accretion of knowledge by a group, or production of collaboratively edited material, including material documenting group projects.*

A technical word of caution should also be sounded, however. For all of the successes in use (if not necessarily uptake) as described by Franklin and van Harmelen there are always caveats. In 'Web 2.0: Addressing the Barriers to Implementation in a Library Context'[44], Brian Kelly notes that:

> *A significant concern centres on questions regarding scalability of the Web 2.0 approach. Information professionals are usually concerned with finding institution-wide approaches to service provision* […] *If other approaches start to be used it becomes difficult for these to be managed in a consistent way across the institution. For example, a tutor might decide to use a service* […] *to create his or her own online reading list. Information professionals then face a potential headache in finding out about this list, synchronising it with other approaches across the institution, integrating it with other systems on campus such as the Library System, VLE or portal and presenting it in a consistent fashion to students.* […]
>
> *Information professionals are also concerned about the longevity of Web 2.0 services. By its very nature, Web 2.0 is a dynamic and rapidly moving environment. Many of the tools currently available have been developed by individuals who are committed to the open source and free software movement who may not be backed by commercial funding; the individuals may have a tendency to lose interest and move on to other things once an exciting new piece of technology comes along. Some successful tools may end up being bought by commercial players which might result in their disappearance or incorporation into a commercial charging model. It appears risky to rely on services which may disappear at any time, where no support contract is available, no guarantee of bugs being fixed or formal processes for prioritisation of developments.*

7.6.2 Data recombination

Data recombination has always been at the forefront of sharing, whether it be combining differing result set formats in a single access point or submitting rewritten queries to disparate repositories. The current trend is for data recombination using a web application to combine data from more than one public source to be called a *mashup*. Content used in mashups is typically sourced from a third party via a public interface; some in the

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[43] see http://www.jisc.ac.uk/media/documents/programmes/digital_repositories/web2-content-learning-and-teaching.pdf
[44] see http://www.ukoln.ac.uk/qa-focus/documents/briefings/briefing-103/html/

community believe that only cases where private interfaces are *not* used count as mashups. Mashups are an interesting technical development and any technology that mobilises a large community to think in more detail about how data can be recombined has merit. However, the examples which are presented to indicate how it works in reality tend to be rather trivial or designed to exploit a visual trait which could generally have been achieved by alternative means. We did not find, in the projects we examined, anyone using mashups for sharing elearning content and so were not able to judge how the solutions scale with real data. If there are users who are solving known data recombination use case issues with mashups on a large scale then this would definitely be of technical interest.

8 Pedagogic issues

8.1 Context

Our remit was to report on the instructional approaches used, and on the ways in which the development, use and sharing of elearning content has been found to fit with these approaches, or not. Of the projects that responded to our survey, just over half submitted documents described as having a strong bearing on pedagogy, defined as above. Projects also described their main outputs and classified 30% of these as having a bearing on pedagogic issues. However, the extent to which project outputs that had been described as having a bearing on pedagogy as defined actually did so in a substantial way was more limited.

8.2 Instructional approaches

Two issues stood out:
The first issue – which has reportedly also arisen in JISC's Design for Learning Programme – was the importance of *defining the pedagogic purpose* to which an item of shared elearning content is designed to be put, either with a view to enabling it to be used appropriately, or with a view to making it findable, or both.

> *Successful re-use requires clearly articulating a pedagogical intent and allying it with appropriate choice of resources. This will often still require a team-based approach including other information professionals that places resource demands on the institution.* **DART (**Bond and Ryan, 2007)

The importance of this issue was also highlighted by the EERN project:

> *The major task affected by the underlying pedagogy is the classification of learning resources* [with users having to] *'tag' a newly discovered learning resource into one of a number of learning resource types (e.g. case study, lectures, teaching tips).* **EERN**, Draft Final Report (Fowler, 2006)[45]

and in the DialogPLUS project's 'pedagogical planner' (see below):

> *Underlying the toolkit is a set of pedagogical taxonomies for tasks, tools, resources etc. The toolkit can be used as:*
> *1. a step-by-step guide to help practitioners make theoretically informed decisions about the development of learning activities and choice of appropriate tools and resources;*
> *2. a database of existing learning activities and examples of good practice which can then be adapted and reused for different purposes;*
> *3. a mechanism for abstracting good practice and metamodels for elearning.*

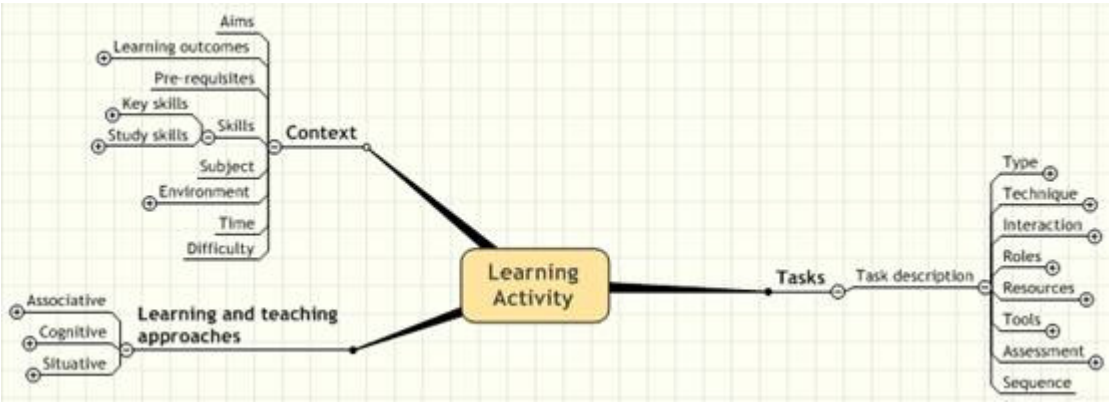


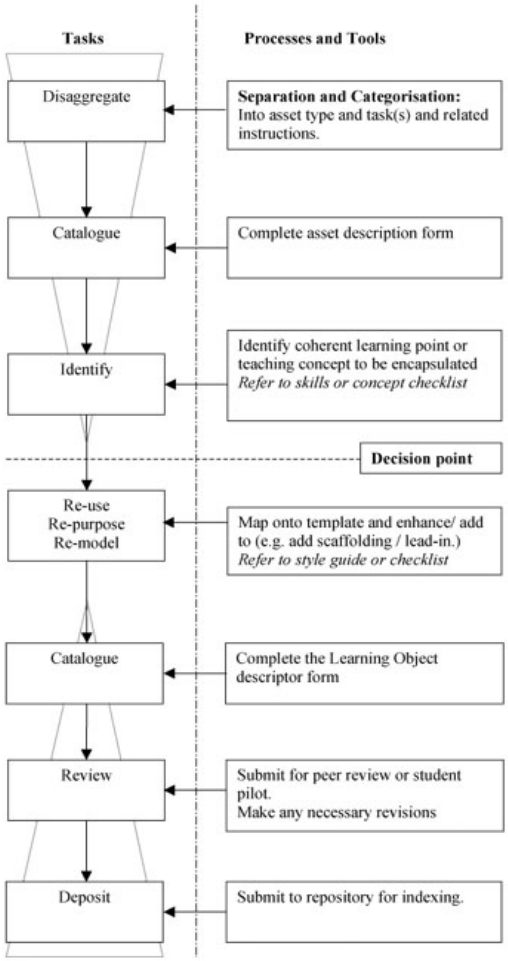
Diagram copyright Conole and Fill (2005) – original at http://edutechwiki.unige.ch/en/DialogPlus_Toolkit

> *At the heart of the DialogPLUS toolkit (DPT) is the notion of a learning activity, consisting of three elements:*
> *1. the context within which the activity occurs, including the subject, level of difficulty, the intended learning outcomes and the learning environment;*
> *2. the learning and teaching approaches adopted, including the theories and models;*
> *3. the tasks undertaken, which specifies the type of task, the techniques used, associated tools and resources, the interaction and roles of those involved and the assessments associated with the learning activity.* **DialogPLUS** – Final Report (*Davis H. et al. 2007*)

and also by the L2O project's 'Pedagogic Driven Process Model' (see below):

[45] see also 'Using Ontologies to support the sharing of learning resources' by Michael Gardner - http://www.elearning.ac.uk/features/delta

Pedagogic Driven Process Model for L2O



Original larger diagram at:
http://www.elanguages.ac.uk/researchcommunity/projects/l2o/pedagogic_outputs_diagram.doc

Project outcomes so far have highlighted that the critical success factor for re-use and re-purposing is the need for the materials to be 'attractive' to the end-user (teacher and/or learner) in terms of:

- *Their context (the need to add context-rich metadata)*
- *The presentation of metadata so that it assists in resource discovery and material selection*
- *Their ease of re-use or ability to be re-purposed.* **L2O**, Final Report (Dickens, 2006)

A different approach was taken by the **DART** (Digital Anthropological Resources for Teaching) project, three outputs from which have '*all been proven to be transferable, reusable, and re-purposable*'. A key characteristic of the DART outputs is that they include comprehensive and thorough explanatory information, both technical and pedagogical, about the way they are intended to be used, and about the way they can be modified. DART demonstrated:

> *the effectiveness of a participative approach linking research with teaching, involving collaboration between academic staff and learning technologists.* **Caroline Ingram**, DART

The second issue was the extent to which there is *a shared and large-scale context* of use for the content. Examples here included **CeLLS**[46], which aimed to:

1. *Establish a major project in transformation to student based learning within the Life Sciences*
2. *Design and develop a set of coherent and rational curricula for degree and Higher National programmes in Life Sciences*
3. *Develop interactive elearning materials for the core part of the curricula*
4. *Develop a set of institutional-specific assignments and formative assessments to contextualise the core materials to the degree and HN streams*
5. *Establish a sustainable learning community for the Life Sciences within Further and Higher Education in Scotland.* **CeLLS**, Extract from explanatory leaflet

and **REHASH**:

[46] http://www.cellsproject.org/ . CeLLS has a deliverable due shortly which should be relevant. 'It will include a breakdown in roles and responsibilities and narrative to explain the reasoning behind the chosen processes'

The primary target of the project was to address the re-purposing of 60-70% of the learning objectives for cells, tissues, and organs from the basic and clinical sciences for medicine (HE 1 and 2), and approximately 30% of the objectives of the one-year Access to nursing course and the foundation course for medicine (HE0) In both cases, the targets have been superseded, with a greater than expected coverage of learning objectives.
In addition, there were supplementary objectives that were considered in the original proposal and these are beginning to emerge as project outcomes:

a) *resources do compete ergonomically and in quality with the existing rapid and efficient process used for assembly of teachers lesson plans*
b) *resources are attractive to both teachers and students*
c) *resource sharing has strengthened existing collaborative relationships between the FE and HE partners*
d) *institutions that have not created these resources are willing to use them in their own courses with little or no compromise.'*

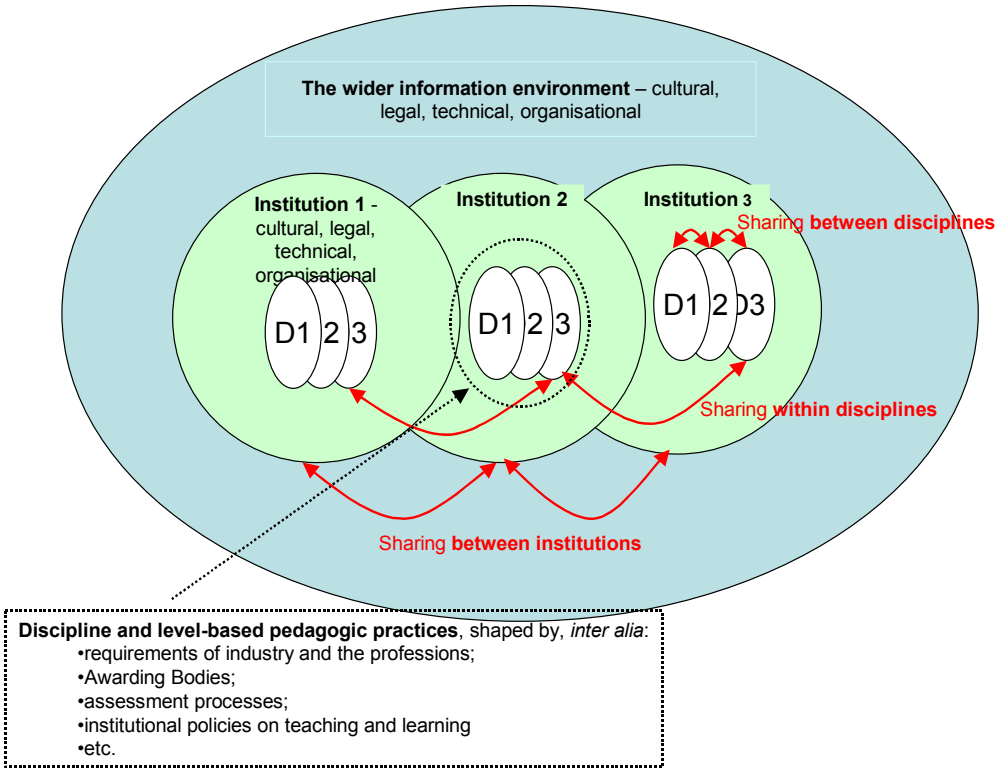
In summary, the project is already beginning to demonstrate that resources can be effectively re-purposed to different educational levels, made sufficiently 'generic', and shared by courses in different institutions. There is also genuine enthusiasm on the part of teachers in both FE and HE to utilise these resources, regardless of where they are made, so that the resources are not restricted to web-based learning but can also be use in the classroom, thereby forming a blended approach. **REHASH**, Final Report (Balasubramaniam et al 2006).

From the evidence we have seen, we believe that sector resources would best be concentrated on sharing that involves institutions or discipline communities which have a common 'delivery endeavour', as in the case of REHASH, CeLLS, DART and DIDET; where sharing is part of the solution to an immediate problem that the institutions, or discipline community, want to solve. We therefore recommend that institutions should participate in shared endeavours to produce, maintain and use (past the end of the project) elearning content for a particular course or courses across a large number of institutions (say more than ten) and mandate a future commitment to sharing those materials with a wider (UK) academic community. Whilst we believe that funding such a large scale and ongoing endeavour would not be an appropriate use of JISC money, it would be appropriate to fund a feasibility study and to encourage institutions themselves to participate.

8.3 A framework in which to consider pedagogy and sharing elearning content

The diagram below puts sharing between institutions, between disciplines, and within disciplines into an overall framework which JISC might choose to develop and refine for future use. For example, proposers might be required always to indicate:

- whether the focus of a project is on sharing between disciplines, between institutions, or within disciplines (or a combination);
- the academic level(s) and the courses or learning programmes to which the sharing relates;
- the pedagogic focus of the proposed sharing.



9 Appendix 1 Table of recommendations

Appendix 1 of the original report contained the twenty six summary recommendations identifying stakeholders (JISC, FHEIs, other funders, Jorum and the wider elearning community). They also appeared at the end of each appropriate section. They have been omitted from this public version at JISC's request.

10 Appendix 2 List of projects

This is a list of the projects included in the synthesis; most by reading their outputs and/or contacting them directly; a few by reading evaluation or synthetic materials. Project contact details and links to outputs and websites can be found on the JISC wiki at:
http://www.ukoln.ac.uk/repositories/digirep/index/SharingeLearningMaterialsSynthesis

Project title	Contact name
ASK –Accessing and Storing Knowledge	Howard Noble
BlendEd –a blended learning and teaching approach for Business and Social Care courses in Further Education	David Dyet
CDLOR –Community Dimensions of Learning Object Repositories	Colin Milligan
CeLLS –Collaborative eLearning in the Life Sciences	Wendy Nightingale
COLOSSUS –Collaborating on Learning Objects in Social Science for Unlimited (online) Study	Jim Everett
DART –Digital Anthropology Resources for Teaching	Caroline Ingram
DialogPLUS	Hugh Davis
DIDET –Digital Libraries for Global Distributed Innovative Design, Education and Teamwork	Caroline Breslin
ECTP –E-Construction Transformation Project	Jackie MacMillan
EERN –East of England's Educational Resource Network	Chris Fowler
e-swap	Jenny Gilbert
G4L –East Midlands NTI Gateway for Learning	Paul Rowley
HE Academy/Cultural issues projects	Eddie Gulc
Jorum	Jackie Carter
L_2O –Sharing Language Learning Objects	Kate Dickens
LADIE –Learning Activity Design in Education	Isobel Falconer
Learning Bank	Jane Sisk
Personal Learning Portal Pilot	Phil Poole
PerX –Pilot Engineering Repository Xsearch	Roderick A MacLeod
PORTAL –Presenting natiOnal Resources To Audiences Locally	Ian Dolphin
PROWE –Personal Repositories Online: WIKI Environment	Anne Gambles
REALM –repurposing and re-use of on-line materials	Kate Pearce
Regional Distributed eLearning Baseline Study	Education for Change Ltd
REHASH – Re-purposing Existing Health Assets to SHare	Chara Balasubramaniam
RepoMMan –Repository Metadata and Management	Richard Green
RESET –Rejuvenation of Science, Engineering and Technology related TLTP and other legacy material	Barry Beggs
Rights and Rewards in Blended Institutional Repositories	Steve Loddington
SFC Transformation Projects	Lou McGill
SPIRE –Secure Personal Institutional and Inter-Institutional Repository Environmer	David White
Surf WBL –Staffordshire University Regional Federation, Work Based Learning	Fleur Corfield
The Spoken Word	Iain Wallace
TrustDR – Trust in Digital Repositories	John Casey
UKCDR –UK Collaboration for a Digital Repository for High Stakes Assessments	Andrea Owen
Web 2.0 for Content for Learning and Teaching in Higher Education	Tom Franklin
WM-Share –West Midlands Share: Promoting shared use of digital teaching conter across the West Midlands Region	Viv Bell
X4L Staff Development Resources	Lou McGill

11 Appendix 3 JISC Rights in Digital Environments (RIDE) Recommendations

For JISC

Policy formulation

R1. Encourage and support the development of professional responsibility within FE and HE institutions towards the 'licensing-in' and 'licensing-out' of copyright works, including encouraging the provision of relevant levels of training in intellectual property management to all appropriate staff.

R2. Seek proper representation on UUK negotiation team with reproduction rights organisations.

R3. As copyright is now being increasingly driven at the EU level, liaise with other EU organisations to exercise influence and lobby at the appropriate level - for example, via the Bologna process on the future development of higher education in Europe on the basis that copyright and other rights issues in the digital environment should not become impediments to the free flow of educational services in Europe.

R4. Encourage co-operation with national and international organisations on development and standardisation of rights metadata.

R5. Lobby government to consider a more satisfactory rights registration and clearance system sustained by appropriate incentives, such as the type of US statutory rights following from voluntary registration.

Sectoral co-ordination

R6. Collaborate and co-operate more effectively with other sectoral organisations (e.g. UUK, SCOP etc.) with regard to development of intellectual property reports and guidance across the FE and HE sectors. This will help to prevent duplication of effort and also to ensure the efficient dissemination of coherent guidance across the sectors.

R7. Ensure that initiatives to educate the FE and HE sectors about intellectual property and copyright are properly related to other information management initiatives and issues, such as processes and tools designed to fulfil institutional obligations under the Freedom of Information Act 2000.

Programme co-ordination

R8. Draw together the disparate resources produced and to co-ordinate the work on intellectual property rights that has been carried out, and that which is currently being undertaken, across the activities of the JISC (eLib, TLTP, JISC Legal, TASI, JORUM etc.). This will help to prevent duplication of effort and also to ensure the efficient dissemination of coherent guidance across programmes and services.

Development work

R9. Commission a detailed survey and analysis, with case studies, of the effectiveness of current rights clearance methods in FE and HE in meeting institutions' legal obligations, and disseminate guidance on good practice in rights clearance procedures.

R10. Explore the possibility of developing a centralised rights clearance mechanism for FE/HE institutions.

R11. Commission a detailed survey and analysis, with case studies, of exemplar institutions and consortia in relation to effective handling of intellectual property rights.

R12. Develop an IPR toolkit to provide an integrated approach to both 'licensing-in' and 'licensing-out' of copyright works.

R13. Follow up on the detailed recommendations of the JISC/Intrallect Digital Rights Management Study Report.

R14. Encourage the development and use of a common set of licences or licence templates for: a. FE/HE inter-institutional licensing of works, including repurposing; b. Licensing of works by FE and HE institutions from third parties, including repurposing; c. Licensing of works from FE and HE institutions to third parties; d. Licensing/assignment of works by academics to third parties.

R15. Encourage and support research into, and development of: a. globally unique identifiers for use in digital rights management; b. suitable application profiles of digital rights expression languages; c. metadata standards and incorporation of metadata into workflow processes.

FE/HE management

R16. Provide key institutional decision-makers with rationales for, and evidence of, the importance of rights management. This may be achieved via:

a. a JISC rights management roadshow highlighting good and bad practices, including provision of information about practices at exemplar institutions (e.g. the Open University), and examples of damage to institutional finances and reputations stemming from rights management failures;

b. stricter criteria imposed on the provision of JISC funds to projects at institutions that fail to demonstrate effective rights management processes to encourage good practice.

R17. Encourage FE/HE institutions to adopt a coherent and uniform approach to institutional copyright policies by producing guidance and model policies for institutions on:

a. first ownership rights in works created by employees in the course of their employment, including effective methods of securing and licensing the rights in those works, as necessary - also need to consider academic freedom issues;

b. joint ownership rights in works, e.g. works created by employees in the course of their employment, by contractors and employees, and by students and employees;

c. rights in works created by students in the course of their studies, and effective methods of securing and licensing the rights in student works, as necessary;

d. advising staff on the types of publication terms that are acceptable to the institution, and procedures for seeking institutional approval to publish with publishers whose terms are outside the norm;

e. obtaining and retaining necessary rights in works for inclusion in institutional repositories;

f. the use, reuse, and repurposing of third party materials in the digital environment, including clear statements on rights clearance procedures.

g. the use of Open Source and Creative Commons licences in conjunction with an institution's business strategy allowing classification of institutional missions and aspirations and determination of appropriate licensing to meet those objectives.

R18. Encourage FE/HE institutions to engage in proper risk assessment for publishing in institutional repositories by producing guidelines that cover: a. appropriate legal risk factors, including copyright, that should be assessed; b. terms and conditions for contributors, including copyright and moral rights issues; c. material withdrawal and removal, i.e. use of 'notice and takedown' strategies.

FE/HE staff

R19. Increase staff awareness by producing straightforward advice in the form of briefing materials and training packs for:

a. academic staff on the implications of assigning or exclusively licensing their works to publishers, and the alternative licensing options, including model clauses.

b. academic staff/staff developers on the use, reuse, and repurposing of third party materials in the digital environment

c. academic staff/staff developers on the use of student-created works in the digital environment d. academic staff/staff developers on the purpose and legal effects of the Creative Commons licence and OSS licences

Students

R20. Encourage greater involvement of students in the rights management processes of FE/HE institutions by producing briefing materials and training packs for institutions to use with students on: a. rights in works created by students in the course of their studies, including information on co-owned works, and ways of licensing the rights in works b. the appropriate use, reuse, and repurposing of third party materials in the digital environment c. the purpose and legal effects of the Creative Commons licence and OSS licences

Projects

R21. Require all JISC-funded projects, as part of the bidding/proposal process, to complete a legal risk assessment as part of the project bidding process, in order that the relevant legal risks are identified, understood and addressed by both the project parties and the relevant JISC managers - this will be part of the process of embedding good IPR practice into both institutional procedures and JISC programmes.

R22. If JISC requests projects to consider making project software deliverables available under an open source licence, JISC should provide a limited set of appropriate licences, and an overview of each licence's implications for the future development and exploitation of the software - this will help promote uniformity in choice of OSS licence in the FE/HE sectors, and increase sectoral understanding of the effects of such licences.

R23. If JISC requests projects to consider making project information resources available under Creative Commons (or similar) licences JISC should suggest a limited set of appropriate licence options, and provide an overview of each licence's implications for the future development and exploitation of the information resource - this will help promote uniformity in choice of Creative Commons (or similar) licences in the FE/HE sectors, and increase sectoral understanding of the effects of such licences.

R24. Provide all JISC-funded projects with guidance on the appropriate structure and content of Consortium Agreements, with particular emphasis on project administration, partner rights and responsibilities, and intellectual property rights (including terms in employee contracts and contractor agreements).

For others:

R25. **Subject disciplines** - could develop guidance for academics in their field on the intellectual property policies of publishers in their disciplines (using the SHERPA/RoMEO Publishers' Copyright Listings where applicable), as well as information on publication venues such as web journals and 'author-pays' journals.

R26. **Learned societies** - could promote the use of pre-print and abstract repositories, such as the SSRN, to increase the acceptability of pre-print digital publication of works amongst academic publishers.

R27. **Funding bodies** - could require organisations and consortiums bidding for funding to demonstrate appropriate and effective institutional processes for rights clearance and 'licensing-out' of copyright works in the course of their projects, as they do for ethical considerations and institutional policies on good conduct in research.

R28. **FE and HE Institutions** - need to actively promote and develop institutional repositories for learning objects and research works, as development of these will provide a clear incentive for managers and academics to engage more fully with the intellectual property process.

12 Appendix 4 HEFCE Intellectual Property Rights in e-Learning Programmes Report

The following points (*in italics*) were made by the Executive Summary to the HEFCE Intellectual Property Rights in e-Learning Programmes Report of July 2006[47]. Our responses appear below each quotation.

> *3. A higher education institution's (HEI's) IPR management strategy will depend on the business model it uses in its e-learning programme and its particular mission for the dissemination of knowledge.*

This demonstrates a recognition that the education sector is not homogenous, and that promoting a one-size-fits-all business strategy is unlikely to work.

> *4. Every HEI needs to establish a clear, preferably plain English, IPR policy and disseminate it widely across the organisation, including IT guidelines and codes of practice for staff and students.*

The Rights and Rewards work demonstrates effectively how this can be developed in practice.

> *5. Every programme maker needs to follow a basic legal framework involving clear and straightforward contracts covering all its relevant relationships, from staff and end users to collaborators and overseas agents.*

There is a need for clarity in relationships, for common understandings of legal rights and obligations, and the establishing and underpinning of trust relationships –staff need to know that management at all levels are acting according to an agreed set of conditions concerning legal relationships rather than making arbitrary and possibly discriminatory decisions in similar circumstances.

> *6. HEIs should own the IPR in the e-learning materials created by their staff, and contracts of employment should make this explicit. This also applies to freelance and, where agreed by them, to student creators.*

It is almost incomprehensible that, at this stage in the evolution of FHE institutions, this is not already the default position, as is the failure of institutions to guarantee by licence the position that staff can continue to use existing works that they have created when they change academic employers. The FHE institutions are increasingly major employers, and the UK FHE sector a key player in the modern international educational marketplace. As such they must be able to deal efficiently and openly with their key stakeholders and with each other. Uncertainty breeds mistrust, and mistrust breeds inefficiency.

> *7. Where HEIs collaborate, a consortium agreement is necessary and should be agreed before any work commences.*

Funders, especially JISC, should not release funds to projects, or should withhold a significant proportion of funding, until an adequate consortium agreement (CA) is produced by collaborating HEIs –until recently, JISC has been lax in this regard, and while there have been improvements, the oversight of this process remains inadequate. JISC should be leading good practice in this area, and currently, despite good intentions, it is not.

> *8. Institutions also need to be mindful that while creating IPR they need to manage it in terms of respecting the IPR of third parties whose material they may utilise. Rights clearance can put a significant burden on an HEI's resources, so a risk assessment should be carried out before adopting a specific rights policy.*
>
> *9. Licensing agreements should be used to protect the IPR in e learning material from abuse by end users and third-party suppliers such as local learning partners.*
>
> *10. In an international context, an HEI should ensure that any contract specifies an agreed legal jurisdiction, preferably a UK one. In this way any dispute can at least be dealt with under familiar legislation.*
>
> *12. The detection and tackling of IPR infringement are a heavy burden on resources. We recommend the use of technological measures to protect IPR in UK and international programmes. Higher education institutions need to implement a risk register and use digital rights management to protect valuable IPR, and their reputations, from infringement.*

We agree with the use of a risk register. Use of technological measures will be dependent upon suitable (simple, easy to use, ideally non-proprietary) and cost-effective measures being available. It is worth noting that it is unclear what is meant by DRM in the context of the HEFCE Intellectual Property Rights in e-Learning Programmes Report. A clear explanation of what such terms mean in a given context is an essential ingredient of promoting understanding and co-operation.

> *14. Higher education institutions need to make IPR management central to the planning and implementation of any e learning programme and staff training should be a priority in this regard. There is currently insufficient training for staff in handling IPR issues. There should be across the board training for all staff, as well as more specialised training for those working in rights clearance and those managing the creation of e learning programmes.*

[47] http://www.hefce.ac.uk/pubs/hefce/2006/06_20/

This is crucial. Despite past recommendations, virtually no concentrated sectoral action has been taken. There are isolated pockets of good practice, e.g. the OU (which has very different business from most FHEIs), but otherwise the recommendations seem to have fallen on deaf ears. The TrustDR education pack has significant potential, but without impetus from key players (JISC, HEFCE etc.) behind it, it too will become another worthy but forgotten project deliverable. A key problem with staff training at FHE institutions is that there are simply not enough expert training staff to meet demand, and while expertise can be bought in from outside the sector, this is often costly, and the training not appropriately targeted to an HEI audience. FHE institutions need to take the educational element of IPR policy seriously, and to invest in the type of educational resources and training staff appropriate to the sector's unique needs.

> *15. Institutions should be as keen to educate their authors about IPR as they are to claim ownership over the work their authors have created.*

Again this has been talked about, and recommendations made, for over a decade; yet the sector is still failing in this regard. The questions are 'Where is the education is going to come from?' and 'Will it be appropriate for an HEI, as opposed to a commercial, audience?'

> *16. There is also a need for effective IPR tracking software to support staff clearing rights, and the process should be made as automated as possible. A clear audit trail needs to be kept.*

Regarding the software see point 12. If it is feasible, cost effective, simple to use and non-proprietary, absolutely. Otherwise it has the potential to become an expensive pipedream. A clear audit trail is a laudable goal, but is a software solution required to obtain it or can it be achieved by simple and easy to implement auditing measures?

> *17. Since the production of e learning materials is in its infancy it is appropriate that HEIs set up a reward system for staff involved in their production. This should act as an incentive to contribute to an activity which is not yet seen as an integral part of 'normal' duties.*

This is not strictly a legal goal, but certainly a 'trust' issue. Asking staff in any organisation, in any line of work to engage with a new production process in which the goals and rewards are unclear (elearning materials), at the probable expense of engaging in existing work practices with clear rewards (research, traditional teaching, administration), is in effect seeking irrational behaviour or an illogical leap of faith on their part.

> *18. If e-learning material is produced as a result of special funding from public monies, then free licences to the community in the UK for use of that material are normal practice.*

It is a sad reflection on affairs that this should still need to be spelt out.

13 Appendix 5 Bibliography and references

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14 Appendix 6 Table of abbreviations and acronyms

API	Application programming interface
BECTA	British Educational Communications Technology Agency
CBL	Computer based learning
CEN/ISSS WS/LT	CEN-ISSS Learning Technologies Workshop - the European educational interoperability standards agency
CLA	Copyright Licensing Agency Ltd. - a non profit-making company that licenses organisations for photocopying and scanning from magazines, books and journals
DC	Dublin Core - a metadata element set
DRM	Digital rights management
EUN	European Schoolnet
FE	Further education
FEI	Further education institution
FHE	Further and higher education
FHEI	Further and/or higher education institution
FTE	Full time equivalent (member of staff)
HE	Higher education
HEA	Higher Education Academy
HEFCE	Higher Education Funding Council for England
HEI	Higher education institution
IEEE LOM	Institute of Electrical and Electronics Engineers Learning Object Metadata standard
IP	Intellectual property
IPR	Intellectual property rights
IS	Information systems
JISC	Joint Information System Committee - a strategic advisory committee working on behalf of the UK higher and further education bodies
LOR	Learning object repository
MLA	UK's Museums, Libraries and Archives Council
NSF	US National Science Foundation
OAI-DC	An XML format for the serialisation of Simple Dublin Core metadata descriptions
OAI-ORE	Open Archives Initiative Object Reuse and Exchange
OAI-PMH	Open Archives Initiative-Protocol for Metadata Harvesting
RAE	UK's Research Assessment Exercise
RSCs	JISC Regional Support Centres
SCOP	Standing Conference Of Principals for higher education colleges in England and Northern Ireland
SQI	Simple Query Interface
SUM	Service Usage Model
UUK	Universities UK
VLE	Virtual Learning Environment
XML	Extensible Markup Language - a W3C initiative
XSD	XML Schema Definition - an instance of an XML schema written in the XML Schema language