

ARCADIA

Reading Lists in Cambridge



A Standard System?

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June 2009**

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Executive summary

This report investigates issues surrounding the introduction of a standard system for reading lists in Cambridge.

Arguments for a Standard System

A persuasive case can be made for the introduction of a standard system based on:

- Improvement to the undergraduate learning experience
- Streamlining of workflows
- Focussing of library resource provision
- Promotion of electronic resources
- Integration of list data with other systems and datasets

The adoption of a standard system would fit well into institutional strategies concerned with pedagogic support.

Implementation

The key organisations for implementation are:

- University Library (UL)
- CARET
- Management Information Services Division (MISD)

A successful implementation will rely on engaging key users, particularly academics. The most effective approach would be an initial pilot project for system development alongside a focus group of key users.

The natural home of a set of standard tools for reading lists would be CamTools.

Wider Implications

Some of the wider implications of the adoption of a standard system are:

- A blueprint for collaborative working between pedagogic support providers
- Interoperability of list data with systems and datasets within and outside Cambridge
- Better understanding of how organisations providing pedagogic support function and interact
- Development of new workflows and activities around reading lists

Contents

Executive Summary	1
Introduction and Background	3
Why Adopt a Standard System?	4
Why are Reading Lists important?	4
Where do Reading Lists fit into institutional strategies?	5
What's wrong with the current system?	6
What do users want from Reading Lists?	7
What are the benefits of a standard system?	8
Summary	11
How a Standard System might be Implemented	12
Decision to implement	12
Resourcing a system	12
Engaging key users	13
Key organisations	14
Local and commercial solutions	16
Route to implementation	17
Conclusions	18
Appendices	19
A – Terminology	19
B – CAMSiS Course Codes	20
C – What is a Reading List?	22
D – Hard Coded vs. Generated Links	23
E – Spoonfeeding vs. Research Skills	23
F – Draft Specification	24
G – Local vs. Commercial Solutions	25
Notes	27
References	27

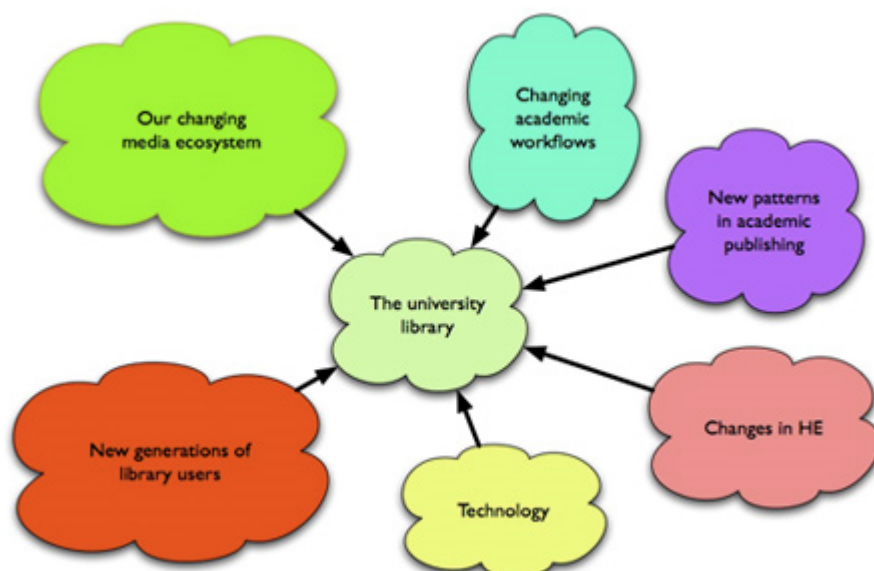
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Introduction and Background

In June 2008 a committee of librarians from across the University convened to investigate ways of improving library services, with particular regard to e-learning and the provision of services to undergraduates. Reading lists quickly emerged as the major factor in undergraduate library use, as influential on the **types** of resources used by undergraduates, and as an area where there was potential for an improvement to the student experience.

One of the committee's recommendations was that an application be made for an Arcadia Fellowship to investigate issues surrounding the adoption of a standard system for dealing with reading lists. The proposal was felt to map well onto the core issues highlighted by the Arcadia Programme – particularly **Changes in Higher Education, New generations of library users, Technology** and **Changing academic workflows**. This report is the result of that Fellowship.



The report will cover two main strands:

- **Why** should a standard system for reading lists be adopted?
- **How** might such a system be implemented?

In answering these questions I will touch upon some specific technical issues regarding reading list systems. However, one point which emerged very quickly is that the major issues to be tackled in the implementation of reading list systems tend to be institutional rather than technical¹.

Why Adopt a Standard System?

Reading lists are already widely used across the University. The introduction of a **standard** system for reading lists is likely to involve a significant investment of staff time and resources. How can such an investment be justified?

In this section I will address the following questions:

- **Why are reading lists important?**
- **Where do reading lists fit into institutional strategies?**
- **What's wrong with the current situation?**
- **What do users want from reading lists?**
- **What are the benefits of a standard system?**

Why are reading lists important?

Reading lists are the area in which academic workflows, student needs and library services interact most directly (for a definition of the term 'reading list' as used in this report see **Appendix C - What is a reading list?**). As the main mechanism by which undergraduates gain access to learning materials, they occupy a central position in the provision of pedagogic support.

Reading list data acts as a bridge between two of the University's most valuable assets – academic expertise and resource provision. This data plays an important role in one of the University's main institutional purposes – teaching and learning.

Reading lists have specific importance for a number of groups across the University:

For Students: In the IRIS report (Edwards-Waller, 2009), a survey of student information skills, reading lists and lecture notes are identified as '... the dominant source of information about books, journals and other course materials', with 97.4% of respondents using lists to find resources. Reading lists were found to retain their importance throughout undergraduate courses.

Other major factors for undergraduates are relevance of, and speed of access to resources. Reading lists are seen as 'very useful ... in helping them to locate relevant material quickly'. Short terms and heavy workload increase the significance of reading lists for Cambridge students.

For Tutors: Tutors see reading lists as important teaching tools, both in directing student use of resources, and in developing students' learning skills and autonomy.

A study of tutor attitudes to reading lists (Martin and Stokes, 2006) found that they were '... generally regarded as having a role in moving students from

dependent to autonomous learners', as well as giving students a 'sense of direction', and 'raising student interest and engagement' in a subject.

For Librarians: As the most important factor in undergraduate use of library resources, reading lists act as a major driver of collection development and circulation policies for the majority of academic libraries.

Dempsey (2003) points to reading lists as 'a place where library and learning management systems intersect'. He goes on to talk about reading lists as portals, or 'an aggregation or collection of resources organised to assist particular categories of user', and about the potential of such portals to play a central role in 'mediating the engagement of users and resources in a networked environment'.

Part of this 'mediation' is the role lists can play in raising awareness (and therefore use) of the **range** of resources made available by libraries – particularly electronic resources.

Where do reading lists fit into institutional strategies?

Coordination between library services and pedagogic activities in higher education has been on the agenda for some time. Considering some of the problems surrounding 'Libraries and Teaching Provision', the Follett Report (1993) suggested:

'One way of overcoming some of these problems would be to provide a single database of reading list material for each course ... If fully developed, such a database would enable students to gain information about recommended reading, and whether it was available in the library or the book shop; lecturers would no longer need to provide their reading lists separately to students, the library, and the book shop; whilst the database could also be used to monitor use of the various options for obtaining material.'

In Cambridge, the issue of coordination between bodies involved in pedagogic support has come into focus over the last few years. The 'General Board Review of Teaching and Learning Support Services Report' (July 2008) (hereafter GBR) pointed out 'the need for better coordination of the current providers of pedagogic support, and better communication between those providers and the Faculties and Departments'. Reading lists are a natural point of coordination between pedagogic support bodies, and are also a major conduit for communication between these bodies and the Faculties and Departments.

The GBR focuses specifically on services offered to those engaged in teaching and learning. One of the issues highlighted is 'the provision of high quality, cost-effective pedagogic support services to students and staff of the University'. The significance of reading lists, especially to undergraduates, makes a good case for a joined-up service based around them.

Focussing more specifically on the University Library, the GBR states that 'The UL is keen to take a greater role in teaching and learning'. The Library's Strategic Plan for 2006/7-2010/11 places an emphasis on 'Improving understanding of the needs of the user community'. Undergraduates form an increasingly significant part of that user community (particularly with regard to the use of electronic resources), and reading lists are central to the understanding of undergraduates' information needs.

One of the principal strategic goals put forward in the GBR is 'that a rapid expansion of the use of e-content should become a key objective for the UL'. In recent years, the University has made a significant investment in electronic resources, and there is a concern that they should be used to their full potential. A key aim of any standard reading list system would be to promote awareness and use of electronic resources.

There has been a broad movement in the University towards increased co-operation between bodies which have operated more or less independently in the past. One way to foster such co-operation is to undertake a project which requires collaboration and interchange.

Co-operative working between Cambridge libraries has been encouraged by the adoption of a shared library system. On the same model, a shared reading list system should lead to similar co-operation and communication between the many groups and institutions involved with reading lists.

The adoption of a standard reading list system for Cambridge would not only be a major step forward in itself, it would also provide a blueprint for communication and collaborative working practices amongst pedagogic support providers.

What's wrong with the current system?

It could be argued that we already have a working reading list system in Cambridge. Reading lists are produced by tutors and used by students to access resources provided (predominately) by the library service. Some departments have already created local systems to add 'findability' and functionality to their own lists².

The main problem with the current situation is not the functionality (or lack of) supported by any **particular** way of handling reading lists, but the lack of a **standard** way of handling them. This limits the usefulness of list data as a whole, making it difficult to integrate reading lists with other data sets and systems operating in the University.

Another, related, problem is a lack of consistency in the student experience of reading lists. Swain (2006) found that the main student priority regarding their experience of reading lists was **clarity**. In the current situation, students may be faced not only with a range of different list functionalities, but also with a range of methods for **discovering** lists.

As stated above, promoting use of electronic resources is a key institutional goal for the University Library. The concern that these resources are not being used as fully as they might be is highlighted by the IRIS report, which found a 'low level of awareness of electronic resources' amongst undergraduates. As reading lists are the major factor in undergraduate resource use, it can be implied that the current system is not **generally** promoting effective use of electronic resources.

Finally, there is no way of effectively measuring how well the current system is working. One consequence of the lack of a standard system is the lack of a mechanism to produce statistics about the effect of list use (i.e. on resource use, on student achievement). Because list data is dispersed and idiosyncratic, we cannot tie it up with course information or resource use statistics. This means that the University is missing out on vital information on important relations and processes in pedagogy and resource provision.

What do users want from reading lists?

Taking 'use' in the widest sense, including those who create and edit lists for a particular purpose, there are three distinct groups in the University who use reading lists. Many of their interests and requirements overlap.

Students use reading lists to **obtain access** to resources. They want easy access to **relevant** lists. They want to be able to **find and use** resources matching citations on lists, and therefore they want libraries and other bodies to **provide access** to those resources. They want their use of lists to **integrate** with other tools and workflows (i.e. VLE, library catalogue). They are interested in different **views** of list information (i.e. priority items only, electronic resources only). As far as possible, they want **access** to and **functionality** on lists to be consistent. They are interested in **information** about lists, for instance which items appear on other lists or **feedback** from other students using the list. Some students are also interested in providing **feedback** to those who create and maintain lists.

Tutors create and maintain reading lists to **direct use of resources** by students in order to support **teaching and learning**. Their main interest is that students should be able to **use** resources matching citations on lists. They want **relevant** list documents to be easily **accessible** to students. They have an interest in students being able to easily find and use resources matching citations on lists. Therefore, they want libraries and other bodies to **provide access** to resources matching citations on lists. They want lists to be easy to create and maintain, and they want these activities to **integrate** with other tools and workflows (i.e. citation managers, VLE). They want to be able to work collaboratively on lists. Some academics point to the importance of list use in developing student **research skills** (see **Appendix E – 'Spoonfeeding' vs. Research Skills**). And some academics want **information** on list use – both related to **use** of resources matching citations appearing on lists, and direct **feedback** from students on which resources they felt were useful.

Librarians use lists to inform provision of access to resources. They need to be able to **access** lists easily. They have an interest in being **informed** of new lists or changes to existing lists. They want to be able to easily **compare** list content with their library holdings. They are interested in different **views** of list information (i.e. priority items only, books only). They want **information** on use of resources which match list citations. They need to promote use of a range of resources, particularly **electronic** resources. They want **advance** information on resources added to lists, or those likely to be heavily used. Some libraries also have a role in **creating** lists and making them available.

In summary, the main interests of those involved with reading lists are:

- Ease of access to (relevant) lists
- Consistent functionality on lists
- Ease of access to resources matching citations on lists
- Promotion of the use of electronic resources
- Integration of list activities with other tools and workflows
- Comparison of library holdings with list data
- Notification of new lists and changes to lists
- Monitoring the use of items appearing on lists
- Development of student research skills
- Accessing or providing feedback on lists and list items

A draft specification for a standard reading list system, based on these needs, can be found in **Appendix F**.

What are the benefits of a standard system?

Broadly speaking, there are four ways in which a standard system for reading lists would be beneficial to the University as a whole:

- Introduction of consistent functionality to individual list documents
- Consistent tools and methods for the production of lists
- Linking of list data with other University systems and data sets
- Improving communication between users of lists

The combined effect would be to integrate reading list use and production into a joined-up and measurable range of services, linking academic expertise with resource provision in support of teaching and learning.

Introduction of consistent functionality to individual list documents

Reading lists in Cambridge already support a range of functionality, some of it fairly sophisticated. However, much of the existing functionality relies on time-heavy manual retyping of citations and generation of hard-coded links to resources. There is also a duplication of effort in writing and maintaining local systems.

A reading list system would allow for the easy introduction of **consistent** functionality across **all** reading lists. The two main advantages would be a

consistent user experience for students, and the streamlining of workflows around list functionality.

An additional benefit would be a move from hard-coded links from citations to resources to generated links (see **Appendix D – Hard coded vs. Generated Links**). This would cut down the effort involved in producing and maintaining lists, ensure that links in lists are up-to-date, and increase awareness of electronic content by allowing links to point to a range of resources.

Examples of functionality which might be applied across reading lists are:

- Generation of links from citations to resources
- Automated formatting of citation styles
- Transformation of lists between formats (PDF, HTML etc.)
- Generation of different list views (priority items, books only etc.)
- Addition of feedback to lists and list items
- Generation of links to alternative resource repositories (i.e. Amazon)

Consistent tools and methods for the production of lists

A standard system for reading lists would include a tool for the generation and maintenance of lists. Some example functionality might be:

- Dragging and dropping citations from the library catalogue and other resources into a list
- Automatic formatting and switching between citation styles
- Automated generation of links to resources
- Consistent methods of defining the scope of a list (i.e. course, part etc.)
- Facility to work collaboratively on lists

As well as reducing the effort involved in producing and editing lists, the adoption of a standard tool would lead to consistent methods of list authoring across the University. This would not only foster collaborative working on lists, but also provide a more consistent experience for list users.

Linking of list data with other University systems and data sets

Perhaps the main benefit of a standard system would be the potential to use list data as an institutional asset to support teaching and learning.

A standard system would facilitate the linking of large amounts of list data with data in other systems – for example, the library management system, VLE and the student registry.

The most obvious use for consistently generated list data would be the production of a structured central repository of links to lists. However, the further benefits of this kind of cross-system linking are enormous, both in the generation of cross system reports (i.e. the effect of library provision on exam

results, the effect of reading lists on library provision etc.) and the development of cross-system functionality (i.e. pulling a student's reading list and library information into their workspace in a VLE, automatically notifying students when resources matching citations on their reading lists become available, automatically marking up a list against a library's holdings).

The GBR highlights the importance of the 'integration of student record data with teaching and learning tools'. CAMSiS and CamTools (via Raven login) are already linked by their common use of CRSids to identify students (and it **should** be possible to create a link from student records to library data). If list **scope** could be described in such a way that it linked up with course information held in the student registry (see **Appendix B - CAMSiS Course Codes**), and the citation element of list **content** could be made to match up with resource repositories, then all four sets of data would be able to 'talk to each other'.

Improving Communication

Reading lists act as a conduit for communication between various groups and institutions in the University. Tutors use lists not only to communicate with students about which resources they should be using, but also to communicate with libraries about resource provision. In an essay on libraries and reading lists, Chelin (2005) argues that lists 'should include consideration of not just what students should read but how they will get access to it'.

Without a standard system, these communication channels tend to either break down or become confused. One consequence is that faced with a range of reading list 'systems' students lack clarity on how best to use lists to access the most valuable resources; and if they find lists difficult to use there is no clear method for providing feedback. Another is that libraries often experience difficulty providing adequate access to resources on lists.

A standard system would provide a clear means of communication between tutors, students and libraries. Libraries would receive clear and relevant information regarding items appearing on lists. Students would have the opportunity to provide feedback about lists and list items. Institutions would have access to information about lists and list use. A standard system for reading lists would not only improve the student learning experience, but also provide a framework for more general communication and co-ordination across the University.

Summary

Reading lists play an important role in teaching and learning, forming the bridge between pedagogy and resource provision.

The reading lists already in use in Cambridge support functionality, but this functionality is not standard or consistent.

Communication between groups involved with reading lists can be patchy and confused.

The key users of reading lists are students, tutors and librarians. Each group has a range of interests relating to their use of lists.

Some of the main benefits of the adoption of a standard system would be:

- Consistent user experience
- Ease of access to resources
- Ease of list discovery
- Streamlining of workflows (functionality, list maintenance, stock management)
- Promotion of electronic resources
- Tie-up with data from library management system, VLE and student registry
- Tie-up with library resource discovery tool
- Generation of statistics and reports from list and other data
- Improvement in focus of resource provision to undergraduates
- Clarity of communication between groups

As well as meeting the key needs of list users, the implementation of a standard system would be a step towards the development of integrated pedagogic support services across the University.

How a Standard System Might be Implemented

If we have come some way towards establishing that there is a need for a standard system for reading lists, we have still not examined how such a system might be implemented.

In this section I will discuss issues surrounding:

- Decision to Implement
- Resourcing a System
- Engaging Key Users
- Key Organisations
- Local and Commercial Solutions
- Route to Implementation

Decision to Implement

A range of groups and institutions across the University have a stake in reading lists and stand to benefit by the introduction of a standard system. One complication of this situation is that it is difficult for any single group or institution to take a decision on system implementation.

Models for successful system implementation consistently rely on endorsement at a high level in the institution. The JISC Systems Implementation InfoKit (2008) points out that 'Organisations always remember to appoint a Project Manager, but often do not understand the importance of the other roles or forget to assign the responsibilities of a Project Leader/Sponsor and a System Owner'.

The GBR recommends that 'there should be a rolling development programme of pedagogic support and innovation implemented by the UL but steered by a new Teaching and Learning Service Steering Group (TLSSG)'. The adoption of a standard system for reading lists would appear to fit into this framework, and the involvement of the TLSSG (a joint sub-committee of the Education Committee) would imply the endorsement of both the University Librarian and the Pro-Vice Chancellor for Education - as well as facilitating the 'close collaboration with the Education Committee' called for in the GBR recommendations.

The University Library would appear to be a natural system owner, particularly in the light of the intent (from the GBR) for CARET to become part of the University Library.

Resourcing a System

Any decision to implement a system will involve the securing of adequate resources (staff and funding) for the development/procurement and the ongoing maintenance of a solution.

The GBR indicates that funding might be made available for the provision for the costs of 'the software and hardware necessary to support the development of pedagogic support materials, as well as the additional costs of these resources themselves' and 'staffing needed to support and manage these methods of pedagogic support, which may be additional to those currently provided by either the UL or Faculties and Departments, and/or may require training, development and reorganisation to maintain skills in step with development'. It has already been argued that a persuasive case could be made for the adoption of a standard system in the context of recommendations made in the GBR.

The major strand in any case for funding would be based on the benefits of a system to users and institutions. However, a supporting argument could be the potential long-term savings across the University brought about by streamlining of workflows and sharing of resources. A standard system would rely on centrally maintained functionality, expertise and training, implying a significant reduction in duplication of effort. The adoption of a standard system could be framed as a cost-effective way of improving user experience and institutional efficiency. The Journals Coordination Scheme provides a good model for the benefits of a centrally administered service in a similar context.

One potential funding model could be the initial establishment of a pilot project (a small team working with a targeted group of users over a limited time period - see below for further explanation of this model) followed by an evaluation to establish whether further investment was necessary or merited. If such a project could be framed in such a way that it had relevance to the information world in general, there would be the additional opportunity to secure external funding from bodies like JISC. Given that monolithic system implementations are, in any case, problematic, this model could go a long way towards establishing a standard system with minimal investment.

Engaging Key Users

While the needs and opinions of students and librarians are important, reading list systems tend to stand or fall on the engagement of academic staff. Where direct engagement is absent the administrative burden of list creation and maintenance tends to fall on library or secretarial staff, leading to a duplication of effort and stretching of resources. One of the points highlighted in a system implementation at Plymouth University was that 'getting lecturers on board has always been a big challenge'. A short questionnaire on electronic reading lists sent out on LIS-LINK at the end of 2008 found that 'Academics played a very limited role in all responses'.

Academics are the drivers of reading list systems in that they actually create and maintain reading lists. Without widespread academic participation any standard system would fail. We have already seen that persuasive arguments can be made to academics in terms of teaching and learning (i.e. concrete benefits to students) and in terms of ease and consistency of list creation.

However, in an implementation we would have to address the question of how to actually get people using the system.

Essentially there are two ways of engaging key users. The first is to implement the system and make its use a general policy from the outset. This kind of 'enforcement from above' is unlikely to work in Cambridge. The second is to develop and implement the system alongside a small group of innovative users who are already (at least partially) convinced of the use-case. The involvement of librarians in this group would also be crucial to the success of any implementation. Initial development would also be likely to rely on a focus group of student users.

As well as having the advantage of developing the system alongside its key users in a 'live' environment, this method of using 'system champions' allows for a gradual uptake based on demand - a model which would also suit the resourcing strategy outlined above.

Key Organisations

University Library

The potential involvement of the University Library in decisions on implementation and as a possible 'system owner' have already been discussed. The GBR also points to the Library having a role in the **implementation** of pedagogic support systems under the direction of the TLSSG.

The University Library has experience of the development/procurement, rollout and maintenance of both local and commercial systems. Library staff are already involved in hands-on system development and liaison with system suppliers. Crucially, staff also have experience of handling the interaction of systems (both local and commercial) with other systems and datasets.

More specifically, a key goal of the Electronic Services and Systems Department in the Library is to 'work towards the integration of the Library's resources with the University's learning management systems'. Involvement in the implementation of a reading list system, with the potential to join up VLEs with the Library's resource repositories, would fit well with this strategic aim.

Finally, the Libraries@Cambridge team handle system maintenance, development and training for Faculty and Department, College and Affiliated libraries. Perhaps more importantly, it has well established mechanisms for liaison with librarians across the University. Librarians are important users of reading lists and their participation would be essential to the success of any standard system.

CARET

One of CARET's key aims, as outlined in the GBR, is 'to develop and provide innovative support services for learning, teaching and research'. An E-Learning objective listed in CARET's eLearning Strategy is to 'seek to identify and develop innovations that enhance current learning and teaching practice by making learning and teaching "better" or "easier"'. CARET have already been involved in some innovative work around reading list systems³, and a role in the development of a standard system would fit well into the framework of their institutional goals.

The GBR recommends that CARET should come 'under the umbrella' of the University Library. It goes on to say that 'the UL could oversee and focus innovation in CARET ... without restricting the ability of the smaller organisation to manoeuvre'. A project with the University Library as the system owner, and CARET taking a role in system development not only fits with the report's recommendations, but also provides a useful starting point for a working relationship between the two bodies.

CARET has particular experience of innovative systems development alongside academics in the University. As stated above, academic engagement is crucial to the success of any reading list system. CARET's contacts and experience in this area would be invaluable. In addition, if the model of an initial pilot project were to be followed, CARET's expertise in securing funding from external bodies could be an important factor.

As an organisation, CARET 'meets a need to support innovation', can 'respond rapidly' and is 'willing to take risks'. These attributes fit well with the model of a time-limited and focussed period of system development, followed by assessment and wider rollout. CARET are already used to working in this framework, and also to the 'handover of maturing technologies' to other organisations – in this case, either to a commercial system provider or to another body in the University.

Integration with VLEs would be a core aim of any standard reading list system. CARET is the developer of CamTools, the most widely used VLE in the University. CARET's involvement in the project would facilitate such integration, and the dissemination of reading list information through CamTools would cement it firmly at the heart of the undergraduate online learning experience. There would also be a possibility of making CamTools the site of list creation and maintenance, offering an integrated service based around existing tools and interfaces.

If CARET were to be involved with a reading list project it would not only contribute essential skills, contacts and experience, but also provide a blueprint for collaborative work between CARET and the University Library to produce innovative systems for pedagogic support.

Management and Information Services Division (MISD)

The MISD manage the University's central administrative computing systems, including CAMSiS, the student registry. Their Strategy states that 'it is not intended that the Strategy will cover e-learning and related Learning Management Systems ... but the Strategy will include management and administrative applications in support of such work'.

Liaison with the MISD to secure such support is essential to a standard system for reading lists. A core area would be the mapping of reading list data to course information. Course information (as described in **Appendix B – Student Records Office Course Codes**) is held and maintained in CAMSiS. Access to this data would underpin the course classification of any reading list system. A separately held and maintained set of course information for reading lists would lead to problems of data consistency - the MISD Strategy itself states that there should be a 'policy for collecting and storing data once for use many times'.

One of the main benefits of a standard system would be the ability to deliver relevant reading list information directly to students via VLEs and other tools. Such functionality would rely on accessing data on student-to-course mapping, also held in CAMSiS. A challenge outlined in the MISD Strategy is 'to ensure that each and every system can identify an individual unambiguously and share individual data accurately with other systems'. Tools built around a standard reading list system would rely on such accurate sharing of individual data.

In the broader sphere, one of the main goals of a standard system would be to allow reading list data to interact with other systems and datasets across the University. The MISD not only administers systems for holding and maintaining much of this information, it also acts as a focus for policy on data integration in general. Close liaison with the MISD would be essential to the integration of a standard system into University life.

Local and commercial solutions

One of the main issues in system procurement is the choice between local and commercial solutions. Some of the factors involved in making this choice are outlined in **Appendix G – Local vs. Commercial Solutions**.

In recent years the boundaries between local and commercial solutions have become increasingly blurred. More and more commercial solutions are moving towards an open architecture which allows them to integrate with other systems and locally written functionality. In addition, some commercial vendors are offering flexible routes to implementation - including the kind of gradual rollout and institutional tailoring usually associated with local solutions.

A further factor in Cambridge is CARET's role as a systems developer internal to the institution. CARET's involvement would alleviate the problems of institutional direction which often accompany local systems development.

Vendors with new systems often offer the chance for institutions to become development partners. This means working in liaison with the vendor to develop specific functionality. Normally, this functionality would need to be useful on a wider scale, and there is a staff and resources overhead in ongoing liaison with the vendor. However, such a partnership provides one mechanism for accessing the flexibility of local development in the framework of a commercial solution.

In reality, any standard system is likely to be a hybrid of locally written and commercial solutions. An initial local pilot project, as discussed above, would provide the foundation either for a larger locally written and maintained solution, or the adoption of a commercial solution integrating with local systems and functionality.

Route to Implementation

In summary, some stages on a possible route to the implementation of a standard system would be:

- Discussion and high-level endorsement of project
- Decision on institutional ownership of project
- Allocation of resources for pilot project (internal/external funding)
- Pilot project lead by staff from CARET and UL in liaison with MISD
- Development of beta system based around CamTools in a live environment alongside focus group of tutors, students and librarians
- Report to project owners on progress and future directions
- Securing of longer term resourcing for implementation and maintenance of commercial or local solution
- Staged, wide-scale rollout of system
- Ongoing maintenance and development

Conclusions

A persuasive case can be made for the introduction of a standard reading list system in Cambridge. A standard system would improve the undergraduate learning experience, streamline workflows, promote the use of a range of resources and facilitate the integration of list data with other systems and datasets. Such a system would fit well into institutional strategies concerned with pedagogic support, and there is a clear path towards implementation.

On a broader level, a standard system would be significant not just for reading lists but for the University's documents and data sets in general. A system for tagging lists with consistent course information could be used to tag any object concerned with teaching and learning – handouts, syllabi, podcasts, announcements etc. **All** of these learning objects could then be aggregated and distributed in a relevant way across the University.

There are similar opportunities for 'standardisation' in recording information about citations, people, document lifecycles etc. A standard system **could** act as a test case for data policies with much wider ramifications, and the potential to offer a truly integrated online experience to students.

A standard system would also have implications outside Cambridge. The most obvious is the potential for other institutions to follow the same model, or even adopt the same system. However, there are wider implications concerning the re-use of data on an inter-institutional level. By making our list data available for re-use with other data sets, we potentially free it up for all sorts of use, not just within our own institution.

The adoption of a standard system for reading lists fits into the wider sphere of promoting data interoperability both within Cambridge and in the larger academic community. By allowing our data sets to interact we not only extend the services and functionality we can offer to the users of our systems, we also extend our understanding of how our own institutions work. More than anything, this understanding will allow us to **shape** the future landscape of teaching and learning support, as well as responding to new developments and demands.

Appendices

Appendix A - Terminology

Resource: a resource is an entity which a reading list directs a student to **use**. Examples are a book, a chapter in a book, an article, a web page.

Resources/Citations: Citations appearing on lists are often referred to as 'resources' – with the terms 'citations on a list' and 'resources on a list' being used as if they were interchangeable. This gives a misleading impression of the nature of citations. Citations do not usually behave like direct pointers to one resource (other than in the case of unique resources like manuscripts). Rather, they are **descriptions** of resources – and the use of citations on reading lists is along the lines of 'find and use a resource matching this description'. Thus, for the purposes of this report, instead of referring to 'resources appearing on lists' I will use the term '**resources matching citations appearing on lists**'.

Resource Repository: library catalogues, link resolvers, institutional repositories, the internet (for web pages) and any other repository where a resource matching a citation on a list could be found.

Student Registry: the body responsible for recording and controlling student information, such as year, college, school, department, courses taken etc. In Cambridge the student registry is CAMSiS.

VLE (Virtual Learning Environment): a system supporting teaching and learning activities, usually through the sharing of documents and distribution of tools. A number of VLEs are used in Cambridge, the most widespread being the CamTools software provided by Caret.

LMS (Library Management System): a system for storing, manipulating and displaying data relating to an institution's library.

OPAC (Online Public Access Catalogue): the online interface for searching the resources held by a library or libraries (i.e. data held in the LMS). In Cambridge, the main OPAC is Newton.

Appendix B – CAMSiS Course Codes

The Student Records Office is responsible for creating and maintaining the codes used to define a student's course and status in CAMSiS. It would be sensible to use the **same** system to record reading list scope.

The coding scheme is available online at:

<http://www.admin.cam.ac.uk/offices/students/codes/>

The scheme is occasionally revised, and it is possible that the way that Undergraduate data is recorded will be changed to fall in line with the scheme used for Graduates and Postgraduates.

There are four levels of hierarchy:

1. Career

A career is the student's overall status – examples are Undergraduate, Postgraduate and Graduate. There is a special category, Advanced Undergraduate, which caters for:

- Clinical Medical and Veterinary UGs in years 4, 5 and 6
- CASM Maths students in year 4

Careers can be active or inactive. For the purposes reading lists we would only be interested in a student's active career.

It is possible (though rare) to have more than one active career. An example might be a student following an undergraduate course who is also doing a certificate in modern languages. When pulling in list data for these students, it might be best to group lists by career.

2. Program

For Undergraduates and Advanced Undergraduates, the program is simply a repetition of the career (i.e. Undergraduate), with the qualification aim held at the plan level.

For Postgraduates and Graduates the program is the qualification aim of the student i.e. PhD, MPhil, Law etc.

Each career has only one program.

3. Plan

Undergraduates and Advanced Undergraduates have at least two and sometimes three plans. All UGs and Advanced UGs have:

- Qualification aim i.e. BA Degree (3 years) - Plan Type of QU

- Subject i.e. Archaeology – Plan Type starts with U

And some Advanced UGs have:

- A stamp indicating whether they are a Medical or Veterinary student
OR a stamp indicating they are a CASM student

Postgraduate and Graduates have only one plan, which is the Subject.

4. Subplan (listed as Subject (Tripos) Codes on website)

For UGs and Advanced UGs, each Subject type plan is linked to a set of Subplans indicating the examinations attached to the Plan. Examples are 'Archaeological and Anthropological Tripos, Part I', 'Classical Tripos, Part II'. These are the same as the Examinations codes already in use in departments and faculties.

For each Subplan, each student has a term when they are expected to be taking the exam. It should be possible to work out by date which is a student's 'active' Subplan.

Conclusions

For undergraduate lists, it should be possible to classify scope using Subplan (i.e. Subject (Tripos)) codes. Most tutors will already be familiar with these codes. It should be possible to record more than one code for a list.

It would be possible to record information at the Plan level for reading lists with a wider scope, but it may prove confusing, particularly if information is recorded at both the Plan and Subplan level.

Appendix C - What is a reading list?

There are an enormous number of reading lists in Cambridge, and an almost equally enormous variety in medium, structure and size. A useful starting point for an investigation might be to see what these documents have in common.

In terms of use:

- **Created and maintained** to direct use of resources
- **Used** to obtain access to resources
- **Used** to inform provision of access to resources

And in terms of information:

- **Scope:** audience, school, department, faculty, part, course
- **Structure:** sections, priority, text
- **Content:** citations describing resources
- **Status:** in preparation, published, expired

Some of this data might be implied rather than explicit in the list document³. However, these are all things we can **say** about reading lists. Every list has a scope, a structure, content and a status we can talk about.

For the purposes of this report, a useful definition of reading lists might be:

'Reading lists are documents **created and maintained to direct use of resources, used to obtain resources**, and to make decisions about **provision of access to resources**.

Lists have a **scope**, a **structure**, **content** and a **status**.

Not all of this information has to be **explicit** in a list, but all of it can be **implied**'.

Appendix D - Hard coded vs. Generated links

The adoption of a standard system would enable us to move away from hard-coded links (from a single citation to a single resource) towards links which are generated from information contained in the citation and re-evaluated **each time the link is used**. This means that changes in resource repositories, as well as any changes in the citation, are reflected in real time.

As outlined in **Appendix A - Terminology**, citations do not usually act as direct pointers to a single resource, but as indicators to resources matching the citation **description**. Generated links are a more realistic representation of the **nature** of citations than hard-coded one-to-one links between citations and resources.

Generated links would also allow us to quickly and easily point the **whole list** at a different set of resource repositories (i.e. point the list at a different OPAC, at a different link resolver etc.) without manually changing any of the links themselves. This would theoretically allow you to point one institution's list at another institution's resource repositories.

Appendix E - 'Spoonfeeding' vs. Research Skills

There is concern amongst academics that students should develop research skills through use of reading lists. The 'spoonfeeding' of students, either with classmarks or with direct links to resources, is sometimes seen as hampering the development of these skills.

However, there are strong counter arguments - that navigating documents with complex links to resources is likely to be a very valuable research skill in the future, and that through the use of linked documents, students become aware of repositories and tools that they might otherwise have missed.

Appendix F – Draft Specification

General

- Must support the harvesting and parsing of list data for re-use
- Must support APIs to list data
- Must include tool for list creation and maintenance
- Should allow for transformation between formats (PDF, HTML etc.)
- Should integrate with existing tools and systems

Scope

- Must allow recording of **scope** by school, department, faculty, part, module etc.
- Must tie-in with any existing schemas in use for recording scope (i.e. those used by student registry)
- Must be hierarchical in application – i.e. move from the general to the specific
- Should support access control i.e. private, public etc.

Structure

- Must support hierarchical nested sections
- Must support free text with embedded citations
- Citations must be able to appear anywhere in list
- Should provide for addition of tutor and contact details at list level and at section level
- Should allow enough flexibility for lists to serve as multi-functional documents (i.e. contain pedagogical content)
- Must provide capacity to enter or generate dates of creation and 'last update', along with operator, at list level

Content

- Must allow for recording of citations describing bibliographic and other resources
- Must allow citations to ranges of works, individual works and parts of works
- Must support intelligent generation of links from citations to resource repositories
- Must cater for multiple results from generated links (for when citation matches more than one resource), particularly to electronic alternatives
- Should also support hard-coded links to single resources
- Should allow generation of display citations in a variety of formats
- Must allow the addition of notes to individual citations
- Should allow the addition of comments/ratings for student feedback

Status

- Must allow recording of list status i.e. preparatory, published, expired, so that different versions of lists can co-exist.

Appendix G – Local vs. Commercial Solutions

Functionality and Development

Commercial solutions tend to have more 'complete' functionality, partly as a result of vendors being able to devote more resources to product development. The costs of developing this functionality are shared with other users of the system. Commercial vendors are better placed to form partnerships with other commercial bodies (i.e. with publishers of electronic content) and so extend the functionality of their products. However, vendors are in the business of selling their systems, so development **can** be directed towards tying customers in or selling the product to new customers rather than resolving the issues of existing customers (these factors have become less important in recent years, as many vendors are keen to open up their products and to retain a loyal customer base).

Local solutions can be tailored to the particular needs of an institution. You have complete control over development, though the institution must devote appropriate resources in the long term (the most common problem with local solutions is that they tend to get 'left behind'). There is no tie-in other than the investment you have already made in the system. Development can be focussed on the particular issues important to your institution. Development costs are not shared with other institutions, and must be shouldered internally.

Support

Commercial solutions usually offer a full package of upgrades, support, training and documentation, in return for an annual charge. Essentially, this means that you don't have to **worry** about support, though you do have to rely on the **standard** of support you are getting, particularly as you often won't be able to fix problems yourself. In theory, you are guaranteed a certain standard of service by your contract, but the actual situation **can** be very different. As with development, support may not be directed to your institutions particular needs. There may be an active user group to provide extra support in the form of help with troubleshooting, and possibly additional functionality.

For local solutions, you have to provide documentation, training and support for the people using the system. These can be tailored to the particular needs of your institution. However, appropriate resources have to be earmarked for support, particularly for a system in widespread use. In critical situations (i.e. loss of system) you **can** attempt to fix the problem yourself, but you rely on the availability of a staff member with appropriate expertise. You may find yourself in a fairly isolated position, lacking external expertise either in the form of a support department or a community of users, and unable to capitalise on other institutions' work.

Rollout

The majority of commercial solutions come as one package, with the intention being to roll out the system in its entirety over a fairly short period. In this model, training is only provided during this period, without any contingency for gradual uptake. For systems (like reading lists) where one would expect a gradual uptake, it is possible that by the time a significant number of people are using the system, the formal training programme will already be over.

Local solutions can be rolled out gradually, both in terms of uptake and functionality. A system can be offered 'as a service' rather than imposed, a model which is likely to work much better in the Cambridge model. It is possible to be flexible, with development priorities shaped by needs and issues which arise during rollout. Training and promotion can be ongoing, and responsive to circumstances.

Some commercial vendors are adopting a more flexible approach to system rollout, tailored to the needs of the institution.

Cost

On paper, commercial solutions tend to look more costly, with a large initial investment followed by annual maintenance charges. However, local solutions (even those which use open-source software) have huge hidden costs, particularly in terms of staff time and expertise – not only to write the system in the first place, but for ongoing development, support and training. The biggest problem with local solutions is that they often stagnate owing to a lack of adequate long-term resourcing.

If you are going to support a large-scale local solution, then you have to form a department in your institution which **acts** like a systems provider. This gives you considerable local control, but can lead to confusion over institutional goals (i.e. are we a systems provider or an educational and research led organisation?) Resources for development and maintenance must be earmarked for the life of the system, which can conflict with funding models.

The major advantage of local solutions in terms of cost is that investment can be rolled out gradually to follow system uptake. This means that one avoids the situation of procuring a system at enormous cost and then having to explain why, a year later, not many people are using it (it is unlikely that a reading list system will have a very rapid uptake in the first year). Systems are often scrapped or sidelined at this point, before they have had time to 'bed in'. If investment follows uptake, you have a better model for gradual rollout alongside continued development, and a much better chance of a successful system in the medium term. Some commercial vendors are now also offering a gradual rollout model.

Notes

1. 'One thing that stands out in the analysis of systems projects is that few fail for technical reasons'. JISC (2008)
2. e.g. Plant Sciences, Divinity, Earth Sciences and others.
3. See the Plant Sciences reading lists at:
<http://www.plantsci.cam.ac.uk/partiirefs/index.html>

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