

Arcadia Project Review - A View From Elsewhere

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Summary

This report provides an overview of activities carried out during Michaelmas Term, Autumn 2009, as part of a Cambridge University Library Arcadia Project Fellowship on "Rapid Innovation in the Library".

The approach taken during the project was to look for opportunities for "quick wins" in the current library setting that could be used to illustrate potential (and tangible) benefits from engaging with current and emerging technologies and changing trends in user behaviour. Where possible, the work built on work undertaken as part of the previous Arcadia projects. Regular blog postings were used to document project activities on the [Arcadia Project Blog](#) and the [Arcadia Mashups Blog](#).

The report is structured as follows: several thematic areas that emerged during the course of the project are identified (Information Skills and the "Google Generation", The Cambridge Library System, Library Catalogue Innovations and Custom Search, The Library's Role in Teaching and Learning, Mobile Apps, Rapid Prototyping Skills and Techniques), and summaries of work carried out in those areas provided, along with links to the corresponding project blog posts. Where appropriate, I provide a list of personal recommendations about future "quick win" opportunities within each of these areas.

Disclaimer:

Whilst the author is sensitive to the different user types attracted to Cambridge Library service users, (local undergraduates, local researchers, local academics (whether for teaching or research), visiting scholars, visitors to specialist collections), as well as the Legal Deposit role of the University Library and the various relationships the libraries have with vendors of subscription content, the various user types are generally not referred to explicitly in what follow. However, in certain areas, it may be the case that certain observations or recommendations do not apply to all user types, or even to more than one user type.

Personal Recommendations

Information Skills and the "Google Generation"

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Assume that discovery happens elsewhere, and focus on fulfillment	Library proxy support for Camtools, Library widget, and third party tools such as Zotero, Google Scholar	Increased use of library resources from locations that users inhabit	Less control over users' search experience; difficulties in providing support on third party systems		
Develop strategies for promoting effective search skills using the dominant web search engine(s)	Google "tip of the day" on Library public information screens; tip sheets and off-the-cuff "did you know?" observations in all training sessions	More effective search behaviour in dominant search tool	Increased reliance on using Google products through more powerful use of them		
Develop skills amongst the Librarian community for creating custom current awareness and alerting tools	Brainstorming sessions around how to use alerting tools; provision of current awareness dashboards/webtops such as Science@Cambridge	Evangelism of current awareness tools through their effective use	Increased reliance on information being pushed to a user rather than them searching for it		

The Cambridge Library System

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Streamline item types/lending categories across Cambridge University Libraries	Circulate the list of different loan types in all its glory and run a variant of a Delphi questionnaire to see if you can get libraries to rationalise them	Simpler maintenance across Voyager systems; more consistency user experience across libraries	Changes to current way of doing things may cause short term upset		
Use loan statistics to identify optimal loan periods, and explore the extent to which lending behaviour is predicted by reading lists	For undergraduates on a course with weekly reading lists, look at modal return periods for list related book loans for a selection of courses.	Maximise availability of borrowable books and encourage regular library use according to a schedule sympathetic to course schedules	Segmenting data may prove problematic unless CRSID and course affiliations are known		
Organise a 'one library to the left' day in which Library staff work in another Cambridge library	Create an opportunity to spot and share best practice across libraries	Innovation from the inside	Total chaos and low morale		
Improve signage in the UL	Identify typical journeys and only use signage for navigation; improve signage and repeat	Less confused patrons	Less interaction with staff		
Review library regulations regarding the use of cameras in the library,	Review current camera based mobile phone applications relevant to education and library use	maximise potential for user innovation wrt use of mobile phone applications that make use of mobile phone cameras	Illegal copies of rare works or images; photos of librarians in their natural habitat appearing on the web; -)		

Library Catalogue Innovations and Custom Search

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Provide support for "bookable in advance" delivery slots for stack requests, and review opportunities for a 'local delivery and collection' service from College and Departmental libraries;	Document current stack request IT workflow from request to notification to the user and look for a place to delay the request according to user defined schedule; pilot local returns of UL books in a sample of College and Department libraries	Reduced late fees; more timely return of books. Increased use of college and departmental libraries	Reduced late fees (!) - unless a small charge (less than late fee) is made for a local return. Reduced engagement with UL		
Further develop the JSON API to the Voyager catalogue(s)	Carry on development	Facilitate the development of new user interfaces, including widget based and mobile interfaces	Developer time required for development, maintenance and support		
Open up access to the hidden catalogue	Just do it	i) Provide librarians with inspection copy opportunities; ii) Provide academics and researchers with a 'new titles' alert service and inspection copy service; iii) Support prioritisation of getting works onto the stacks via public catalogue requests.	Depositors of copyrighted works might take umbrage about widespread use of deposited books, especially by third parties outside the UL		
Explore the use of Google Books	Explore extent to which library holdings of particular categories of books are covered by Google books and for which full text search might be useful	Full text search to parts of particular collections (e.g. College and Departmental libraries)	Kiddies using Google and not paying proper due respect to print books.		
Explore the use of Google custom search engines	Trial a variant of the SCONUL infoskills CSE on the UL website	Targeted resource discovery services in particular contexts, such as course related search engines delivered via CamTools	Patrons unsatisfied with being presented with resources not from University of Cambridge		
Explore opportunities for improving note-taking 'accessibility'	Shortcode formulations of unique identifiers on the library catalogue	Makes taking down written web location details easier	Completely irrelevant - users never write down these URIs		
Explore opportunities for supporting visual search	Annotate library catalogue pages with QR codes; modify a pre-existing barcode reading software library for Android mobile devices to work with UL barcodes	Maximise potential use of tools in people's pockets	Disenfranchise users without access to smartphones; wild goose chase - no-one's interested in using apps in the Library context		

The Library's Role in Teaching and Learning

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Course aggregator	Produce a sample resource aggregator around a small number of courses; hand craft it if necessary	One-stop resource banks might show increased uptake and provide opportunities for cross promotion of resources (e.g. ebooks, online journal articles)	Resistance and bad will from old school academics who prefer Reading Lists to be distributed on parchment		
JISCPress	Republish several exam papers and Reading Lists for a small number of courses and produces Science@Cambridge like demonstrators showing how content can be repurposed	Disaggregated content can be reaggregated and republished in new and useful ways	Disaggregated content could go all over the place; too hard for mortals to get their head round.		
Develop the Keeping Up With Events app	Work with Caret et al to improve API/RSS support from events publishing platforms; improve look and feel of demonstrator app; create device native (offline capable) applications	Provide a cross platform "What's on in Cambridge" mobile application for University promoted public lectures and cultural events	Not UL core business (possible conflict with OEAC, who own most of "what's on" & branding); waste of developer time and effort; unwarranted support requests from mobile users looking for an event they can't find		

Mobile Apps

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Geocode all Cambridge University locations	Location service API	Augment Talks@cam with accurate location information. Feed into resource management processes and timetabling, [indirectly] increase knowledge of space usage. Potential for powerful room booking and scheduling usage	Availability and quality of service must be guaranteed if it becomes a core service. Potential conflict with buildings management organisations		
Develop a "Libraries in Cambridge" mobile application from loosely couple components	Libraries in Cambridge location finder/opening times information; personal library access/record; "find in this library" catalogue; visual search integration;	Provide 'in your pocket' library services to users inside and outside the library	Reduced use of public access terminals/catalogues, and the "main" UL websites		

Rapid Prototyping Skills and Techniques

General Recommendations	Specific Actions	Benefits	Costs/Risks	Accepted (Y/N)	Action ?
Continue to make API services available to Library services	Layer new user interface functionality on top of an API using expose machine readable data (XML or JSON-P)	Eating your own dog food proves the APIs and guarantees service quality for third party developers	Third parties may hit your API and impact on its performance		
Develop capacity in lightweight, user-led rapid application prototyping	Run informal drop-in show'n'ask sessions with technology evangelists	User driven innovation and prototyping; hands-on IT development	Unsolicited support requests; applicatins outside the control of central IT provision		
Encourage librarian and developer participation in community events such as Mashed Libraries and Dev8D	Sign at least 1 developer up for next Dev8D session and 1 librarian and 1 developer for the next Mashed Libraries event	Community building outside the Cambridge context; personal skills development	Lost days in the office. May be more beneficial to get people to non-sector tech skills events to broaden mindset		

Major Themes

Information skills, and the "Google generation"

Over the course of the project, several reports were released relating to the behaviour of current students and young researchers in the library context. In particular, library users are as likely, if not more likely, to use Google search products for discovery than they are to use Library provided resources. Where the Library can help is in fulfillment - providing books and online, subscription based materials to students.

Reading Lists and lecturers/tutors appear to be key elements in the provision of information about resources to undergraduates. Reading Lists appear to be provided to support Parts, examination papers, individual lectures or lecture courses, and even specific tutorials. The use of Reading Lists to support collection development appears to be *ad hoc*, in part because there is currently no systematic way of discovering Reading Lists (this issue was raised in a previous Arcadia Report by Huw Jones). An opportunity exists to make headway on the provision of Library supported Reading List discovery in the immediate future, for example by presenting registered students with copies of their reading lists directly when they log in to CamTools or the Library Widget based on reconciling their CRSID with information about their registered courses provided from MISD; (see also "The Library's Role in Teaching and Learning").

Whilst surveys outside Cambridge suggest that students are starting to draw on resources outside formally recommended academic texts, now might be an opportunity to open up a conversation about the wider notion of *Resource Lists*, cf. Reading Lists, that in addition to traditionally referenced content (book chapters, journal papers) might also include references to:¹

- online videos and lectures,
- archival video and audio material,

- Open Educational Resources (OERs) from other HE institutions,
- informal "blog content".

If discovery of this sort of material is currently being driven by students, rather than academics/supervisors, is there a gap in terms of awareness, and discoverability, of these resources within the teaching community that could be addressed by a Library led initiative? That is, is it the role of the Library to make *academics* as well as students aware of recently made available teaching resources, particularly those from outside the traditional channels, that may be used to support or enhance particular courses?

The academics, rather than the Library, may also play the pivotal role in developing students' information skills. In many cases, it seems as though students prefer asking academics, rather than Librarians, for support in resource discovery. This suggests that rather than trying to train student end-users, leverage may be more effectively applied by training the academics/instructors. However, I would imagine that this is likely to meet with a certain amount of resistance, unless the academics can be sold on the benefits of using a particular tool; trained in its use; and then encouraged to evangelise its use. So for example, let us consider the case of an academic who relies on a reading list that contains references into the recent journal literature for a particular course. If the subject area is an actively researched one, such as biochemistry, keeping the Reading List current may be a significant overhead. The use of alerting services from subscription databases, or contents list subscriptions from JISC sponsored services such as TicTocs, provides one way of maintaining current awareness. But what if the Library could play a role in helping provide preconfigured current awareness services, tuned to a particular course?

The [Mashlib Pipes Tutorial: Reading List Inspired Journal Watchlists](#), which was prepared for and delivered at the *MiddleMash* Mashed Library event, describes one possible use case. The tutorial describes how titles of journals identified in a reading list compiled and shared by an academic using Mendeley can be extracted from the reading list and used to automatically create a watchlist over current contents lists for those journals, and then filtered according to a particular topic. That is, by sharing the reading list in an appropriate form, the added value of a topic related current articles watchlist is generated for free. [Create Your Own Google Custom News Sections](#) was a zero day response to new feature offered by Google news that allows the creation of custom news alerts; as consumer facing information tools get ever more powerful, we need to start asking whether the information skills we pass on to our users are relevant, or even fit for purpose.

In contrast to the traditional view of information skills - discovery, maintaining current awareness, evaluating the quality of resources - and based on my own practice, I proposed² a model of information needs based on four criteria:

- discovery;
- management;
- manipulation;
- presentation.

(Note that I am including *fulfilment* as an element of *discovery*.)

In the same way that libraries might expect to enculturate scholars with an understanding of the architecture of the Library in terms of its physical layout and catalogue structure, there is arguably a need to help web users "read" the architecture of a set of web resources. At a practical level, educating users in how to read and manipulate URIs (that is, "web addresses" or "web locations") can help them navigate web sites through editing URIs directly, in addition to using website search tools or browsing via web page based navigation menus and links. Developing skills in the use of the dominant web search engine will, in the short term, improve search behaviour at the basic level (and in a directly transferable way to 'real world' activities) and set the scene for more advanced searches in subscriptions search environments.

Recommendations:

- *assume that discovery happens elsewhere*, and focus on fulfillment. For example, support easy to use mechanisms in local services such as CamTools as well as public services such as Google Scholar that allow users to resolve references to subscription content via authenticating proxies that make use of CRSID credentials. For example, the Library bookmarklet I use most heavily at the OU is one that rewrites subscription content URIs so that they go via the OU subscription proxy ([OU libezproxy Bookmarklet](#)). Encourage the use of tools like Zotero that can augment pages with links to resources through the Cambridge proxy along with awareness of services like Google Scholar's [Library Links programme](#)³ (see [Adding ezproxy to the url - 5 different methods](#) for other alternatives).

- *develop strategies for promoting effective search skills using the dominant web search engine(s)*. For example, "did you know" crib cards or prompts on Google search limits such as *site:ac.uk* (search over UK academic institutions), *-searchterm* to exclude results containing a particular *searchterm*, or *filetype:pdf* (return results that point to PDF documents, such as reports (or *xls* for spreadsheets, etc.).

- *develop skills amongst the Librarian community for creating custom current awareness and alerting tools* based on online subscription or alerting services, using aggregation and filtering services where appropriate, and promote these tools to lecturers and supervisors in the hope that they might in turn make their students aware of them.

The Cambridge Library System

The Cambridge Library system is a complex one, covering the University Library and its dependents, as well as the independent College and department libraries. Whilst initiatives such as [INSPIRE](#) provide scheme for opening up access to academic libraries for undergraduates of any institution, the impression I get from the Cambridge context is users are assumed to use just their own College and Department libraries, and potentially the UL in later years of study; moreover, Part I (first year undergraduate) students appear to rely on College Libraries for the delivery of much of their Reading List content (although I haven't seen the stats to either confirm or deny this claim...)

Libraries provide range of services to library users, including:

- timely availability of resources, either through online access or via physical library holdings;
- specialist knowledge, advice, training and current awareness services;
- the physical library itself.

The provision of a physical library environment is an important one in terms of attracting users. If you're a fan of Vygotsky, or a believer in how the built environment can influence human emotions, you might agree that the Library provides a situated environment for a particular activity, and as such may influence a psychological effect over the user as they enter, work within, or leave the physical Library space. At the very least, libraries typically provide shared personal study spaces, access to computers and/or printing facilities, photocopying and/or scanning services, personal

circ_cluster_name	patron_group	item_type	loan_period ▲
Earth Sciences Library	EAS-UnderGrads	Short loan	1
Asian & Middle Eastern Studies Library	ORS-Undergrad	Short loan	1
Classics Library	CLA-Undergraduates	Short loan	2
English Faculty Library	ENL-Undergraduates	Short loan	2
Judge Business School Library	JIM-Non	Short loan	2
PPSIS Library	SPS-UGradO	Short loan	2
Computer Laboratory Library	COMP-Undergraduate	Short loan	3
Mill Lane Library	LAN-Undergraduate	Short loan	3

A "Short loan" is for how many days?

If a decision is made to reconcile loan periods, it may be worth paying attention to borrowing statistics in order to see whether loans segment into natural categories. For example, with loans to undergraduates working to a weekly reading list, one might expect a 10-14 day loan period to accommodate the needs of the majority of this class of borrower. By identifying natural segments, loan periods that meet the needs of the user, as well as encouraging timely returns and so maximising the availability of borrowable items.

Using the UL

As a newcomer to the University Library, it took some time to get my bearings, a task not helped by poor signage. For visitors to events held within the Library, who may not be familiar with the Library, "just ask" is often the only way of finding a particular location. In one case, (related in [Lost](#)), from a starting point with the UL, I missed a meeting in the Morison Room because I was unable to find it!

Whilst trying to photograph UL signage for inclusion in this report, I was taken to charge for using a camera (that is, my *phone*) within the Library. For users of current generation smartphones, an increasing number of camera related applications are now available. From barcode scanners that capture book details and call up bibliographic information or full text search tools using Google Books, to "personal photocopying" and optical character recognition (personal text scanning), maintaining a policy that bars the use of cameras within the UL is likely to act as a brake on patron delivered library innovation ([No Cameras in the Library...](#)). Note also that the act of copying is not universally ruled against within the UL - a self-service scanning/photocopier service is already provided, albeit for a fee.

The provision of the photocopier service might also be reconsidered in the light of the increasing availability of digital content. For example, if a patron scanned the barcode of an item before copying it, an advisory system might be able to direct the user to a digital version of the resource (this would also help track those items that were being copied).⁵

Towards the end of the fellowship period, I started a project within a project looking at the lifecycle of a legally submitted works from the moment they are received by the UL. Unfortunately, the Fellowship ended before I could complete this task, (in fact, I only managed to complete the first part of a work's journey - its experience in the Legal Deposit Office). I would suggest that capturing the lifecycle of a book would provide a sound basis for an Arcadia Fellowship looking at how books are managed from ingest to their appearance on the stacks, in the public catalogue or on the shelves of other libraries. For in the same way that the National Grid reaches out to every electrical or electronic device that is plugged into the mains, so too do legally deposited works reach out to other University libraries, specialist collections and managed series.

Recommendations:

- streamline item types/lending categories across Cambridge University Libraries;
- use loan statistics to identify optimal loan periods, and explore the extent to which lending behaviour is predicted by reading lists;
- organise a 'one library to the left' day in which Library staff work in another Cambridge library;
- improve signage in the UL: identify typical journeys and only use signage for navigation;
- review library regulations regarding the use of cameras in the library, particularly with respect to potential for use of mobile phone applications that make use of mobile phone cameras.

Library Catalogue Innovations and Custom Search

Currently, Library OPACs are most powerful when being used for a known item search; (note that I am not considering other Library catalogues/indices here, such as subscription databases; just the catalogue that documents local physical holdings). That is, they provide a means of determining the availability and physical location of a work specified in a reference obtained by other means, a self-service step in the fulfilment phase of discovery. Current trends suggest that the OPAC could on the one hand be leveraged to play a fuller role in the discovery of unknown items, perhaps related to a searched for item, or recommended directly via a student's reading list, and on the other used in a more direct way to support fulfilment, such as via a mobile device that can be taken into the stacks directly.

The following issues were explored during the course of the project:

[Stack Request Delivery Slots](#): the Cambridge University Library has many of its borrowable books on closed stacks, which means you have to request books that are then fetched by a team of runners for the requesting patron. To what extent might it be possible to allow bookable collection slots so that a patron can request an item for collection at a future time and date? A simple delayed queuing system could hold the request until it was timely, or release it to a fetcher when they were in a nearby stack stack on another request. The use of SMS, or social messaging (Twitter) alerts when a request has been fulfilled might be more useful to patrons than an email notification. An extension of this approach might be to offer local collection of requested works, whereby requested books are delivered to college or departmental library collection points at 1-2 days notice. (This in turns suggests a reciprocal returns mechanism, where UL books can be returned to college or department libraries: an intra-Library Loans (iLL) scheme, maybe?!)

[Visual Links – Sharing Links With QR Codes](#): an earlier Arcadia project reported an anecdotal comment relating to patrons photographing OPAC screens. What might a library catalogue look like if a QR code (2 dimensional barcode) was added to it to allow a patron to grab a machine decodable reference to a work directly from the catalogue screen? A demonstration of how OPAC pages might be annotated with QR codes was constructed, along with a Cambridge Library short link service that could provide the first step in making it easier to scribble down a book reference rather than have to write a long reference or URI down.

del.icio.us mashups / Brett O'Connor.

Main author: O'Connor, Brett, 1978-
Title: del.icio.us mashups / Brett O'Connor.
Published: Chichester : Wiley, c2007.
Description: xxiv, 381 p.
ISBN: 9780470097762 (pbk.) :
0470097760 (pbk.) :
Formerly CIP.
Notes:
Subjects: Mashups (World Wide Web)
Web sites--Directories.
Internet addresses--Directories.
Links: Table of contents only
Publisher description
Contributor biographical information

Holdings Information

Location:	UL: Order in West Room (Not borrowable) (Click here to make a stack request)
Classmark:	2008.9.31
Number of Items:	1
Status:	- Available

Record View
- Staff View

Actions:

- Export
- E-mail
- Recall or Stack request
(Recall for items on loan only, Stack request for Reading Room and West Room books only)
- see item display)
- Print
- View a floorplan showing item locations

Link to this record:

- URL : http://hooke.lib.cam.ac.uk/cgi-bin/bib_seek.cgi?cat=ul&bib=4528529



A Newton Catalogue web page annotated with a 2D QR code that encodes the page's web address.

[Open Library Training Materials and Custom Search Engines](#): the UL already makes use of a Google Custom Search Engine to search over several Library related websites (e.g [Custom Search Engines On Library Websites](#)). This approach was extended in the form of a custom search engine capable of searching over all UK HEI Library websites. This search engine can be used to provide results from trusted sources for information skills/Library training resources in order to enhance the UL's own offerings in this area.

Unlike Google and Amazon, Library catalogues often make do without ranked search results. If the Library aims to provide a more user-focussed, personalised service, to what extent might course information, or aggregated loans data be used as ranking factors when presenting OPAC search results. [OPAC Ground Truth...](#) simply poses a question about the use of ranking algorithms in library catalogues; [JISC MOSAIC Competition Entries – Imaginings Around the Use of Library Loans Data](#) provides a brief review of the JISC MOSAIC (Library loans data) competition entries which demonstrates what sort of data might soon be made available at a sector-wide level.

With the increasing availability of networked mobile devices with web browser capabilities, as well as personal computers and home internet connections, to what extent can we view a borrowed book as an (almost) tethered device? That is, if we imagine that a book is actually connected to the network as a device with a unique identifier, what might we be able to do with it? [BookServer – Like URIPlay, but for Books...?](#) and [LibraryDNS, cf. RadioDNS: Books that Can Phone Home](#) review several ideas from the worlds of online video (content negotiation) and digital radio (linking radio play back to the web) and start to apply them to books.

Recommendations:

- provide support for "bookable in advance" delivery slots for stack requests, and review opportunities for a 'local delivery and collection' service from College and Departmental libraries;
- further develop the JSON API to the Voyager catalogue(s) in order to facilitate the development of new user interfaces, including widget based and mobile interfaces;
- open up access to the hidden catalogue: i) to other librarians, for providing them with inspection copy opportunities; ii) to academics and researchers, in the form of a 'new titles' alert service and inspection copy service; iii) via the public catalogue*, to support prioritisation of getting works onto the stacks. (*Users need not necessarily be notified about the availability of the work - the system might just flag internally that the work has been searched for and would have been found *if* it had been fully catalogued.);

- explore the use of Google Books for providing full text search to parts of particular collections (e.g. College and Departmental libraries);
- explore the use of Google custom search engines to provide targeted resource discovery services in particular contexts, such as course related search engines delivered via CamTools;
- explore opportunities for improving note-taking 'accessibility', e.g. through shortcode formulations of unique identifiers on the library catalogue;
- explore opportunities for supporting visual search, eg through the use of QR codes and barcodes;
- in the UL, modify a pre-existing barcode reading software library for Android mobile devices to work with UL barcodes in order to facilitate experimentation with mobile phone+camera applications in the University Library.

The Library's Role in Teaching and Learning

The 2007-2008 Cambridge Library Annual report *recommended*:

"that the University Library's role should be expanded and that it should become responsible for the provision and dissemination of electronic materials for teaching and learning across the University."

A couple of examples from The Open University provide a glimpse of how OU course codes (which broadly correspond to Cambridge exam paper codes) can be used to aggregate resources as well as individuals around a particular topic.

In the first case, a live proof of concept demonstrator shows how different resource types including ebooks, ejournals and relevant databases can be aggregated around a course code:

The screenshot shows the Open University Library website interface. At the top, there is a navigation bar with links for 'OU Home', 'Study at the OU', 'About the OU', 'Research at the OU', 'Search', and 'Contact the OU'. Below this is a secondary navigation bar with 'Library Services', 'FAQs', 'Contact Us', and 'Site index'. The main navigation bar includes 'Home', 'Library Information', 'Services', 'Collections' (which is highlighted), 'Research', 'Help and support', and 'Search'. A search box is present with the text 'Enter Course Code' and a button 'Get Collections!'. Below the search box, there is a section titled 'Artificial Intelligence Resources' with a sub-header 'To get started with finding information in this subject, use the Computing and Technology Information Search Guide'. A table lists resource counts: 'all (118)', 'ebooks (44)', 'ejournals (42)', 'routes (23)', and 'database (9)'. Below this table, there are four entries for ebooks, each with a title, author, year, publisher, and a 'more' link.

Resource Type	Count
all	118
ebooks	44
ejournals	42
routes	23
database	9

ebook: APA engineered wood handbook
c2002. McGraw-Hill, Online version via Knovel
[more](#)

ebook: Artificial intelligence and soft computing
Konar, Amit. c2000. CRC Press, An electronic book accessible via CRCnetBASE
[more](#)

ebook: Bayesian artificial intelligence
Korb, Kevin B. c2004. Chapman & Hall/CRC, An electronic book accessible via CRCnetBASE
[more](#)

ebook: Chemistry of precious metals
Cotton, Simon. 1997. Blackie Academic & Professional, Online version via Knovel
[more](#)

An example of a course related resources page on the Open University Library website.

The second example is a widely added Facebook application, Course Profiles, that allows users to

self-declare OU courses (by course code) that they have taken, are taking or intend to take. (In the Cambridge context such information could be self-declared or, with permission, obtained automatically from MISD/CAMSIS based on a CRSID cross-authenticated with a Facebook user ID.)

▼ Course Profiles

I am the developer on this application you know. [See all](#)

I am working towards....
M03 [MEng \(Postgraduate\)](#)


I have completed...
T171 [You, your computer and the net](#)

I am currently studying...
L192 [Bon départ: Beginners' French](#)
M887 [Web systems integration](#) 2007K

I am thinking about studying...
M889 [Computer Forensics and Investigations](#) 2007
M876 [Relational database systems](#) 2008

A user badge from the Course Profiles Facebook application

For each course, an activity panel is automatically generated that uses the course code to generate links to course code keyed URIs on the Open University website that specify the location of web pages containing course related information and resources. The application also identifies a user's Facebook friends who have declared the same course code, and can introduce the user to Facebook users they have not friended but who have declared the same course code. A comments wall allows discussion to take place on the topics covered by that particular course.

 **Course Profiles**

A103 An Introduction to the Humanities

What would you like to do?

<p>Course Details View information on The Open University website about this course.</p>	<p>Your friends on this course (5) See which of your friends are studying this course</p>
<p>Find a new study buddy Find somebody from your friends list or network that might make a good study buddy</p>	<p>Recommend to a friend Would one of your friends enjoy this course? Why not send them a message to recommend it to them.</p>
<p>OpenLearn (5) View resources on OpenLearn for this course.</p>	<p>Comments Wall (13) Read what other people have said about this course and add comments yourself.</p>

People who studied this course also studied:

- [A210 Approaching Literature](#)
- [A215 Creative writing](#)
- [A200 Exploring History: Medieval to Modern 1400-1900](#)
- [A219 Exploring the Classical World](#)
- [A207 From Enlightenment to Romanticism c. 1780-1830](#)

Course related resources associated with a particular course code for a course identified in the Course Profiles Facebook application.

As the Open University applications suggest, the task of drawing together local resources around a course is simplified if there is a widely used coding convention for referring to courses. In the Cambridge University context, this is non-trivial, with lecture course names and Examination paper conventions providing only informal identifiers within much of the content that is currently available online; (this issue is covered in more detail in [Looking Out for "Linked Course Data](#) and [Camsis Codes...](#), which describe a brief survey of the cam.ac.uk domain in search of unique identifiers that can be used as hooks for the automatic aggregation of course resources). [The Library's Role in Organising "Course Knowledge"](#) further reviewed how the Library might be the natural place for all manner of content recommendation services to learners. This relates to the earlier observation that now might be a good time to start considering how the Library can support the discovery and appropriate use of a wider class of third party materials outside the traditional textbook, or journal, such as open educational resources and multimedia materials.

One technique I have been exploring in a variety of contexts is how a custom plugin for the Wordpress publishing platform can be used to *disaggregate* content into bite size chunks, each with its own URI and support for embedding each chunk in a third party website. In [Using JISCPress/Digress.it for Reading List Publication](#), I show how a reading list can be published as a simple blog post, with one reference per paragraph, and then automatically disaggregated into separate references. The demonstration website also shows how exam papers published as blog posts with one paragraph per question may be disaggregated into uniquely identified questions. Once disaggregated, it is then possible to re-publish or reaggregate elements. So for example, it would be straightforward to generate a random question server using questions from particular sections of past papers, or provide support for a commenting system based around particular past paper questions (see for example [Examopedia](#) for a related idea).

Recommendation:

- develop a rapid proof-of-concept demonstrator ideally based around CAMSIS codes or any other pre-existing, consistent and ideally universal coding scheme (even if this is just the name of lecture courses) that aggregates content relating to a particular degree area. The demonstrator need not generate a complete or comprehensive list of resources, though it should include different resource types - past examination papers, reading lists, electronic resources referenced on reading lists, timetable information (times of lectures, locations). The intention should be to explore the requirements of a minimal working solution, based around a simple API with user interfaces built on top of the API, and identify any attendant problems in locating and linking to information, and/or structuring and re-presenting/republishing information.

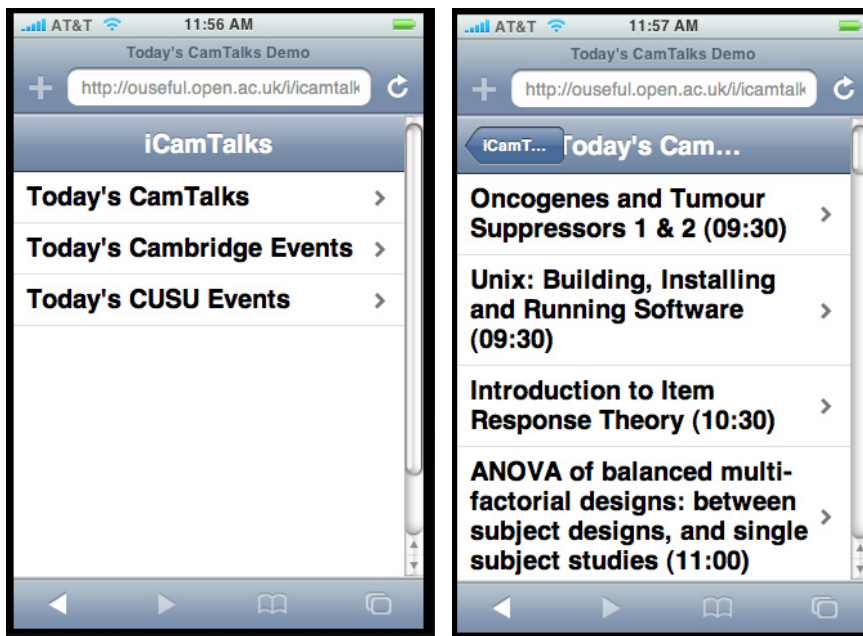
- explore the use of the CommentPress theme for Wordpress as used on JISCPress.org and WriteToReply.org as a tool for the automatic disaggregation and republication of reading list and exam question content. [Disclaimer: I have been involved with both those projects and am a director of Public Platforms Limited, a not-for-profit company limited by guarantee that maintains WriteToReply.org]

Mobile Apps

Mobile phone applications generally come in one of three flavours: web based applications that run across multiple platforms in the phone browser and whose performance is limited by the capabilities of the browser and typically requires a live internet connection; native applications that are downloaded to a phone and that can draw on device level services provided by the phone, as well as the possibility of operating without the need for a live internet connection; and hybrid applications in which a native application may also pull in content or from, or call on services provided by, a webserver.

Even in the short period of time since a previous Arcadia project explored the role of mobile applications in the library context, the pace of development in native mobile phone applications for latest generation phones (Android, iPhone) as well as "application like" web applications that run in the browser of many internet enabled phones is providing a wealth of pointers towards the sorts of application that might prove useful. As well as browser support, the majority of today's mobile phones come complete with cameras, sometimes with wi-fi, typically with Bluetooth, and are increasingly location aware, either through built in GPS sensors, wifi location or cell tower triangulation; it is increasingly possible to build even web based/browser rendered applications that draw on these services. (The same is true of modern browsers that run on laptop or desktop computers.)

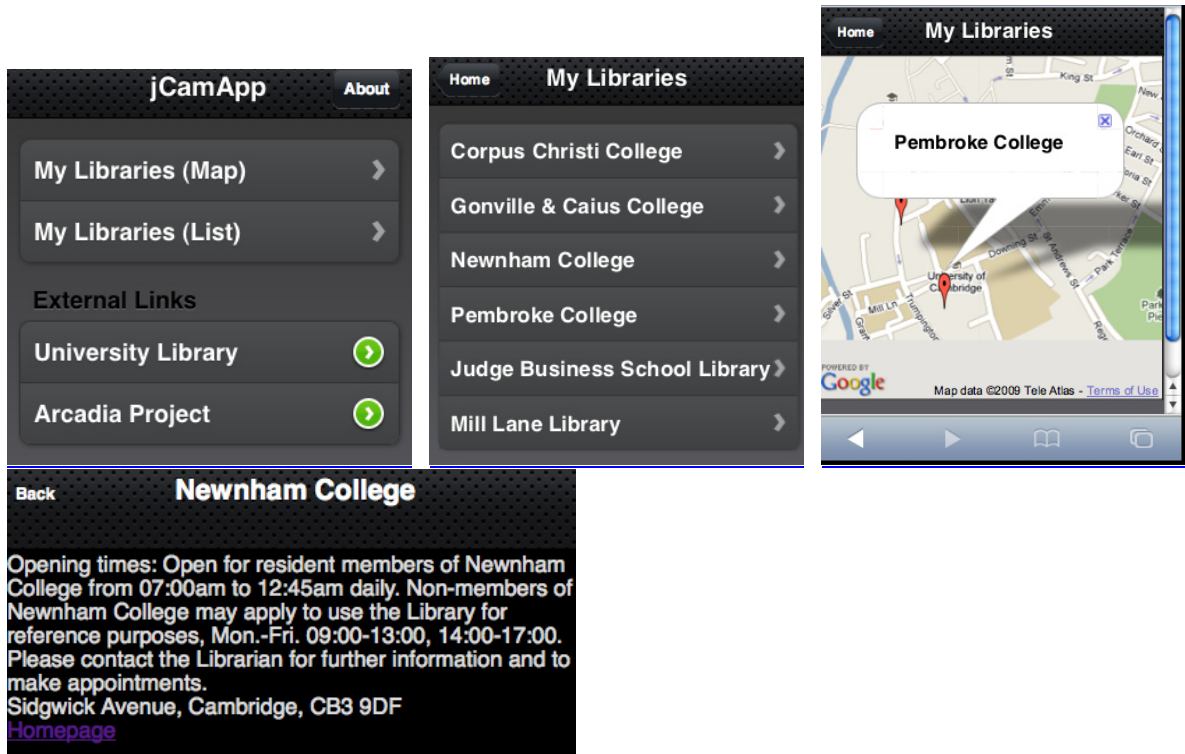
In [Keeping Up With Events](#), I described a proof of concept browser based mobile application that I used quite heavily during the time of my fellowship for keeping track of interesting evening lectures to go to. The application consumed feeds of events for the current day pulled in from a variety of Cambridge University services. Clicking on an event listing would show details of the event (where available via the feed) or provide a link to an event page for the event on the originating site.



Screenshots of a working prototype for a "Today's Events in Cambridge" mobile application.

Whilst the application is not production stable (there were some hacks required in order to get the event feeds), it does work, and provides a powerful demonstration of why events feeds should be made available in a portable format.

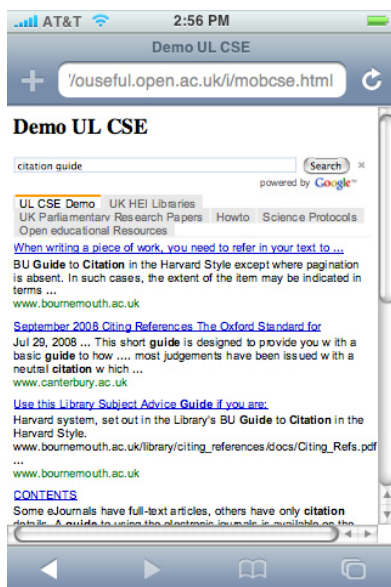
In [Doodling Ideas for a Mobile Library App](#), I described a simple application, again as a minimally working prototype, for locating Cambridge University libraries and displaying library information such as opening times for libraries that a user was registered with, the registration information being obtained via an API call developed for the Cambridge Library Widget.



Working demonstrator of a "find my libraries" app.

(Note that it would be easy enough to provide a generic application that simply serves as a locator of library buildings, along with library information, for users not registered with any library. If location information was provided for venues of events listed in the "Today's Events" application described above, it would be relatively trivial to add map based locator to that application.)

Although not strictly a mobile application, in [Custom Search Engines On Library Websites](#), I also demonstrated how a Google Custom Search Engine could be formatted in a simple manner that is not inappropriate for display on a mobile device.



Lo-fi skin for a Google Custom Search Engine, rendered in a mobile browser.

Two other posts explored additional opportunities for mobile applications. In the post [A Trip into the Stacks...](#), I described a use case for a simple, mobile library catalogue application that would help a user locate books while in the stacks, rather than having to scribble down shelf numbers from a search on one of the public access OPAC terminals. [No Cameras in the Library...](#) focusses on another mobile use case, the potential of camera enabled mobile phones in a library context, an issue I touched on in part with respect to the use of QR-code annotations to the Library Catalogue as described elsewhere.

Several years ago, scanner pens looked as if they may become a tool of choice for scholars, providing as they did the possibility of "highlighting" a block of text and grabbing a digital copy of it, rather than marking it with a transparent fluorescent layer. (Camera phones with support for scanning documents can provide a similar capability.) For whatever reason these devices remained a niche product. At the current time, tools such as Livescribe, which capture a digital copy of handwritten notes as you write them, along with an audio recording if required, offer much in the way of promise, although as with the scanner pens, it looks as though they will not break out into the mainstream commodity market. But what if they did? Apps with everything, or application ecosystems around consumer electronic devices, are helping to drive sales of top-end mobile phones. So what a Livescribe application offer? And could it be translated to the world of mobile phones? In [What If? Livescribe Book Support](#), I consider a couple of opportunities that might arise if Livescribe had a plugin architecture and open developer API (which has since been made available). For example, how might we write down a reference to an ISBN, so that we could then click on it and what might this mean in terms of how a user might engage with a particular work?

Recommendations:

- the UL should work with CARET to develop the Keeping Up With Events app and publish a cross platform "What's on in Cambridge" mobile application for University promoted public lectures and cultural events;
- work with CARET and UCS (and maybe even the publisher of the Lecture list) to geocode all Cambridge University locations, (along with information about which street level 'public entrance' to

use to access each location, where appropriate. Reconcile unique location identifiers between Talks@cam and any other coding scheme (e.g. UCS online map location identifiers); make the location service available as an API and as proof of concept integrate it into the "What's on in Cambridge?" app;

- develop a "Libraries in Cambridge" mobile application based around a set of independent, and potentially interoperable, components:

-- libraries in Cambridge location finder/opening information (e.g. drawing on);

-- personal library access/record (e.g. drawing on the current Cambridge Library Facebook widget);

-- "find in this library" catalogue to support mobile access to the catalogue whilst in the stacks (e.g. drawing on the catalogue JSON API);

-- visual search integration (e.g. drawing on , or exploring use cases relating to pre-existing applications such as Book Mobile, SnapTell and Google Goggles);

Rapid Prototyping Skills and Techniques

I had initially intended to provide a set of tutorials on the use of rapid prototyping and rapid application development tools within the Library context but work did not progress on this as comprehensively as I had hoped. However, the work that was completed does provide a sound basis for an introductory technical workshop on the topic of rapidly prototyped information tools and the exercised trialed with some success at the *MiddleMash* Mashed Library event.

Work focussed on two main tools/approaches - Yahoo Pipes, for processing RSS/Atom feed structured content; and the use of *bookmarklets* for creating simple client side applications that can use or modify particular webpages.

[Getting Started With Yahoo Pipes: Merging RSS Feeds](#) is a quick guide to help practitioners get started with creating their first Yahoo Pipe. This was complemented by a [Mashlib Pipes Tutorial: Reading List Inspired Journal Watchlists](#), produced for the *MiddleMash* Mashed Library event in Birmingham, November 2009. Introductory slides providing a "Yahoo Pipes Quickstart" that were used at the event are also available on [SlideShare](#). [Cambridge Calendar Feeds \(Part I\) - Screenscraping with Yahoo Pipes](#) introduces the idea of "screenscraping" and provides a rather more involved consideration of how to 'scrape' content from a web page and transform it in to a more useful form using Yahoo Pipes.

[An Introduction to Bookmarklets](#) provides a simple introduction to boomarklets, small Javascript programmes that can be saved as if they were bookmarks and then applied to a loaded web page; this post includes a couple of explanatory screencasts, including a demonstration of how to use a bookmarklet to annotate the Newton Library catalogue with QR codes. Further examples of how to create bookmarklets that can be applied to achieve particular aims are provided in two further blog posts (['Get Current URL' Bookmarklet Pattern](#) and ['Get Selection' Bookmarklet Pattern](#)) both of which include novel bookmarklet generators that can be used to help create customised bookmarklets.

Towards the end of the project, I became aware of a JSON API created for the Newton catalogue that allows the catalogue to be queried from an arbitrary webpage. Although I did not have time to explore the use of this API, there should be no particular reason why it can't be quickly integrated into a mobile application to provide access to Voyager search queries from mobile devices.

Recommendations:

- continue to make API services available to Library services. Where possible, when developing new user or administration services, layer the user interface on top of an API that can also expose machine readable data (XML or JSON-P);

- develop capacity in lightweight, user-led rapid application prototyping. Encourage library staff to

make suggestions about potential new services or improvements to current services; where a lightweight 'mashup' solution presents itself, demonstrate the solution to whoever suggested it; - encourage participation in community events such as Mashed Libraries (for developers *and* non-developers) and Dev8D, the JISC developer event (developers).

Conclusion

The Arcadia Fellowship provided a unique opportunity to explore the University Library space, processes, systems and web presence and get to know staff from across the university. Several tangible items were produced as part of the project - mobile "Cambridge Events" and "find My Library" applications, a demonstrator custom search engine that covers UK HEI resources, an illustration of how to use bookmarklets to augment Newton catalogue pages with QR codes in support of "I'll just try it and see" personal prototyping, a review of loan periods across University Libraries (that turned up more than a few inconsistencies) - as well as a wealth of intangible benefits arising from a wide range of stimulating conversations and informal brainstorming sessions. I just hope that others found these conversations at least a fraction as stimulating and useful as I did. As to the activities and observations that didn't make it into the report - I'll keep on blogging on the Arcadia Project blog.

Acknowledgements

No names, but you know who you are... thanks to the Support Group and everyone from across the University who put up with my naive questions and blank stares (I still don't speak FRBR, understand how CRSID authentication works or fully appreciate how to make best use of CamTools...) Apologies for not making the Libraries@Cambridge Conference; maybe next time?;-)

notes

¹ The Arcadia Project blog posts [Do Libraries Cater for Today's Researchers and Research Students?](#), [Do Libraries Cater for Today's Undergraduate Students?](#) and [Seeking Information in the Digital Age](#) review some recent surveys on the use of academic libraries and the online search behaviour of today's students and young researchers.

² Presentation/brown bag lunch: [Time For A Library Shift](#)

³ Students **do** use Google Scholar - so help them get the most out of it, rather than trying to force them to use another system that they can only locate via the Library website. It is only as users develop their information skills that they start to appreciate the utility of more powerful services.

⁴ Brown bag lunches provide one way of sharing ideas, but a more radical solution might be to encourage librarians to work in a different library for at least one day a year (Children in Need or Red Nose Day are two possible candidates, where some inconvenience may be tolerated if it is claimed in the name of charity!). At the very least, this would provide an opportunity for librarians to see how other libraries worked, experience for themselves how the delivery of similar services might differ across libraries, and potentially share or take away ideas for improvements.

⁵ Unfortunately, UL barcodes are not recognised by the standard barcode reading library used by any of the Android phone applications I tried. This meant I was unable to prototype or demonstrate any mobile applications that made use of UL barcodes directly.