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Library subject guides: a content management case study at the Open University, UK

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Article category: Case study

Purpose: To share the experiences and challenges faced by the Open University Library (OUL) in developing a content management (CM) system for its subject guides.

Design/methodology/approach: A summary of multi-format subject guide production at the OUL is provided to justify the decision to develop a new system for their production using a commercial CM system. A detailed consideration of the design and implementation stages is given before a critical review of the project outcome.

Findings: Highlights the complex design and implementation aspects to the project, in part due to the nature of subject guide content itself, and examines the reasons for the CM system delivered not being adopted. Emphasises the importance of CM to future OU applications.

Practical implications: Of interest not only to other academic libraries but any organisation seeking to organise and publish original material for different audiences in a variety of formats from a data single source.

Originality/value: This paper is the first to document a systematised approach to library subject guide production using a CM system and the associated information management challenges and realities of multi-format publishing in an academic publishing context.

Keywords: Content management; Subject guides; Academic libraries; Distance learning; Information management; Reversioning

Word count: 4000 words

1. Introduction

Subject guides are a traditional feature of academic librarianship. Essentially, they distil and codify a body of knowledge relating to the location and retrieval of information in a given subject area or discipline for a defined set of users and/or collection(s).

The inherent flexibility in determining the content of subject guides is reflected in their form, which is neither uniform nor standard. Examples can range from a one-sided leaflet listing resources by title in a particular library to a 120 page bound text to a self-contained section of a Library Web site. This article seeks to share the experiences and challenges of an Open University Library (OUL) project that sought to organise, offer and maintain subject guide content using a content management (CM) approach.

2. Literature review

The history of the subject guide has been one of natural evolution: from a print-based medium to an electronic medium, matching the evolution of librarianship itself. Its *raison d'être*, far from being called into question, has actually been reinforced in the Internet age as library users struggle to navigate through the masses of online information now available to them.

An analysis of the literature reveals a somewhat sparse consideration of subject guides in any medium, especially in the context of UK librarianship. Dunsmore (2002) details their evolution in the context of US librarianship: from the humble reading list to the 'subject pathfinder' in the 1970s (when reading lists were combined with bibliographic search strategies for the first time); to the resource format-oriented guide and the topic-oriented guide; and then, finally, to the online guide in the 1990s.

Dahl (2001) compared 45 online guides from nine Canadian universities. He used guidelines proposed by Kapoun (1995) to form assessment criteria (consistency, scope, readability and use/usability) with a simple scoring system. Not surprisingly perhaps, a great deal of discrepancy was found between subject guides and a 'complexity of structure' identified. This is unique to *online* subject guides on account of the ability to hyperlink to other guide-like materials housed elsewhere on the institution's website or on the Web itself, and thereby blurring the boundaries or confines of the guide itself.

Another problem highlighted in the literature has been maintaining the currency of subject guides, especially the currency of the URLs for any online resources cited. Kitchens and Mosley's study (2000) of Internet guides in which the authors checked 3941 URLs in nine 'Web guidebooks' found that 29% of links were inactive after two years. More specifically, only 61% of filename- based URLs were active after two years compared to 80% of site/sub-directory based URLs. The problem is compounded for print subject guides, which require frequent revisions to remain current, ushering in problems of cost, version control and distribution.

No consideration has been made in the literature of the technical aspects of designing and organising subject guides, which is perhaps surprising in the light of Dahl's comment on their complexity of structure. The impression given is of what one might charitably term a 'cottage-industry' approach, with interested librarians producing subject guides to the best of their ability using standard Web page 'What you see is what you get' (WYSIWYG) editors, outputting them as standalone Web pages or using design templates created for the main library Web site so that they become part of any subject areas of that Web site.

Finally, acknowledgement should be made of subject pathfinders that have been funded on the basis that they will serve the needs of national or international educational communities rather than those of a particular educational institution. Examples of these include the EDUCATE Project [1], funded by the European Telematics for Libraries programme (Third framework) from 1994 to 1997 and, latterly, the JISC Resource Guides in seven subject areas for the UK post-16 education sector [2], which compliment the JISC Resource Discovery Network (RDN) subject hubs and Virtual Training Suite [3].

3. The Open University context

The need for subject guides is accentuated in the provision of library services in a mass distance-learning environment such as the one offered by the UK Open University (OU). Subject guides become a very necessary proxy for the physical or virtual presence of a subject librarian who could not possibly interact with 600 students on one OU Technology course let alone with the total annual OU course population of 200,000 students. Thanks to the close working relationships established over the years between the Library's subject librarians and the Faculty course teams they support, subject guides have become an integral component of the teaching support materials that students on certain OU courses received, especially project courses. Their utility was first appreciated in the pre-Internet era as they collated information on resources that would have taken students an age to identify for themselves, without including the further time required to locate the

resources and use them.

By 2001, subject guide production had become extremely complicated. Some Faculties did not use subject guides at all, others had accumulated a number of different guides for different user groups. For example, the Open University Business School had one guide for the MBA programme and one for the BA in Business Studies programme. The Faculty of Technology had one guide each for two Technology project courses and one for the Development Studies programme.

Each of the guides could exist in any combination of up to three formats:

- commercially printed and bound monotone 118-page paperbacks (see Hunter-Brown & Faulkner (1999));
- self-contained sets of HTML pages included on several course CD-ROMs;
- self-contained sets of static HTML pages on the Library Web site (in addition to separate sets of subject pages maintained on the same Web site).

The challenges for the librarians in the Business and Technology subject team involved in producing and maintaining a total of 10 different subject guide versions were considerable (even allowing for a great deal of content overlap) and unsustainable, demanding an urgent rethink. The intellectual challenge of selecting, describing and organising material coherently in a subject guide is difficult enough before the implications of production schedules and processes, format restrictions and the expectations of the user are taken into account for the different versions.

A simple question illustrates the kind of issues involved: should postal addresses be included for an organisation in an online/CD-ROM guide if the organisation has its own Web site? Arguments against inclusion might include currency (the address given on the Web site is likely to be more up-to-date) and design (addresses take up a lot of room on a page). But an argument for inclusion would be that a significant percentage of the students on the course will be based in developing countries with little or no reliable access to telecommunications and so would need to write to the organisation for information for their research.

Another significant reason for rethinking subject guide production was one of currency. Due to the increasing availability of free online resources and the ever-increasing OUL investment in online resource subscriptions, the printed and CD-ROM guides were out-of-date *during* publication, let alone *after* publication. This meant that 'Stop Press' letters with errata and revised screenshots often had to be prepared and dispatched to students with the guides, adding to the cost and complexity of production.

There were additional currency problems to take into account:

- obsolete links ('link rot');
- migrated Web sites;
- discontinued subscriptions;
- out-of-date URLs or resource descriptions ('resource rot' after 'link-rot').

The subject team ultimately found that 25% of links were out-of-date in one printed guide alone after one year, compared to the 29% after two years identified in Kitchens and Mosley (2000) study.

Pedagogically, the rationale for printed guides in the distance learning context of the OU was also increasingly unclear. If students needed to be online to use the majority of the resources recommended, and an online subject guide already existed, what added value did a print guide bring to their learning to justify the high cost of production, especially if students could print out sections of the online guide to read offline at their leisure?

Faced with increased demand for subject guides across the Faculties with a fair proportion of similar content required in a standardised format, the Open University's production unit (LTS) was willing to test the recently acquired Tridion r4 [4] XML-based content management system (CMS) on subject guide production for the Technology faculty. An XML-based approach to subject guide CM was entirely logical given that the purpose of XML is to separate form from content. Accordingly, in late 2001, a small project team was formed comprising two subject librarians who supported the Business School and Technology Faculty and a senior software developer from LTS.

The aim of the project was to design and implement a system to generate multiple versions of subject guides in multiple formats (HTML, XML and PDF) and designs from single sourced content, thereby significantly reducing the production and maintenance time required and the amount of link/resource rot. The time scale was one year in time for the next presentation of the various Technology courses that used subject guides.

4. Design stage

The content of the existing online frame-based, static HTML Web sites of the Business and Technology guides was analysed, compared and then broken down into its constituent components to produce a set of standardised schema.

All considerations of the meaning of the content were set aside. It did not matter whether a resource was a Web site, book or journal; it was still found that one <resource component> schema could be defined to capture all their salient elements:

- <resource title>
- <resource description>
- <resource URL>
- <help information URL>
- <password protected flag>
- <faculty guide association>

It was found that each page in a subject guide was effectively composed of a grouping of different resources and so a <component collection> schema was defined:

- <collection title>
- <collection subheading>
- <description flag>
- [list of associated resource components]

The twin concepts of components and collections were both simple and powerful and enabled component nesting. A subject guide page with resources organised into sub-headed sections was simply a collection of several component collections and individual components, in the manner of a Russian doll.

The advantage of defining schemas was that this anticipated the use of XML and its intrinsic structured approach to organising information. The software developer was able to use the schema as basis for defining XML document type definitions (DTDs) which in turn would be used to create data input forms in the Tridion system for components and collections.

The second phase of the design stage required a significant amount of the software developer's time to create the XSL code necessary to transform the XML into XHTML output. This phase actually ran in parallel with the data input part of the Implementation stage as the developer required real-life content to test the output of an online XHTML guide.

Coding was complicated by decisions made after the initial schemas had been developed relating to resource descriptions. Traditionally, OUL subject librarians had the freedom to apply their own subject oriented 'spin' in a particular resource description, even if they used a standard shared description as a starting point for its definition. This was particularly true of multi-disciplinary resources such as journal databases. In addition, different emphases could be placed on resources according to the subject guide section in which they appeared and this would consequently affect the length of their description. For example, an aggregated resource like ProQuest's KnowUK [5] might merit a brief description in a section on biographical information but a more detailed description in a section considering online reference books.

In seeking to preserve this flexibility in the CM system, the librarians inadvertently increased the complexity of the system and the XSL code required. For outputting any given resource component, the procedure now had to check the <faculty guide association> flag and then retrieve either the <faculty long description> or <faculty short description> created especially for that resource, based on the <description flag> in the respective collection component. This in turn necessitated the definition of various default states and subroutines if none or only one of the expected conditions was true.

For example, an order of precedence had to be established to deal with circumstances in which one collection of resources using short descriptions formed part of another collection of resources using long descriptions. It was decided that the description flag in the lowest collection in the hierarchy took precedence. This meant that, in a collection requiring a mixture of resources using short and long descriptions, sub-collections containing just one component had to be created in order to display the desired description.

5. Implementation stage

5.1 Data input

It was established early on in the project that there was not the resource to design a process of automatically 'scraping' the data from the existing online guide into Tridion. This meant a laborious cut and paste process was required on the part of the librarians to migrate the data into Tridion as new resource components. This process was additionally lengthened by the speed of the original host server for the system – creating a new component or editing an existing one took about three minutes on average (this improved significantly when a faster server was used). Midway through the input process, it was also discovered that HTML code was inadvertently being copied over with the text from the original online guide. This did ultimately cause problems in the output stage with numerous components needing to be reinputted with 'clean' text.

It became apparent to the librarians once they started creating components using the standard Tridion folder-based interface that a systematic naming convention was required for the components in the system and also a meaningful folder structure. A control mechanism was adopted to ensure that not only all of the online subject guide content was migrated into the new system but also that the eventual output order could be verified. Each page of the online guide was printed out and annotated to define the individual components on the page. Each component was then numbered. Each page was given a short name. The naming convention incorporated all these aspects with additional identifiers to indicate subject guide provenance or to distinguish components from component collections. A 20-character limit was imposed to obviate the necessity to resize Tridion browser windows in order to view folder contents.

In deciding how best to collate the components into a folder structure, an interesting divide between the disciplines of librarianship and computer science manifested itself. The librarians' natural instinct was to group components by information type (books, journals, Web sites, newspapers, databases etc) while the developer's expectation was around application (e.g. components for a Forecasts page should appear together in a Forecasts folder). At times, of course, the two viewpoints converged, e.g. components relating to books would naturally appear in a page named Books. Both viewpoints made sense from the respective disciplines' world view (and from a sheer usability point of view) but did lead to communication difficulties. The librarians' taxonomy reflects the structure of the subject guide it relates to, even though that was not a conscious aim and thereby illustrates a not-insignificant paradox in a CM approach to subject guides: removing form from content for output requires adding form for input.

5.2 Web output

Once all the data from the original online guides had been entered as components in the Tridion system, the individual page collections of components were created. This entailed selecting the constituent components for each page from the folder hierarchy, aided by the naming convention described above, and adding them to the relevant page sub-collections in the right order.

The final stage before requesting Tridion to publish the collections to a development Web server was to generate yet another component (a Web template component) containing the unique .htm filename for the outputted page. It also associated each page with the XSL code described previously to transform the underlying XML into XHTML and also adding a standard header, footer and menu bar to each page. A third component was also associated with each Web template component. This specified for the particular Guide flagged:

- the number of guide sections to display;
- the page <title>;
- the root URL of the outputted guide (e.g. /etec);
- in-text URL display convention (e.g. www. without the http:// prefix).

Once the page was published on the development server, checks could be made about component order and whether or not the intended description was displayed and components edited and republished. It was inevitable that error correction in the initial stages of the project was a slow process due to the complexity and novelty of what was being attempted and the number of variables involved. Unfortunately, concerns about network security meant that the automatic page publishing to the Library Web server was not implemented and so a manual FTP upload of files from the development server to the live server was used instead. This added an extra step to the publishing process and reduced the efficiency of the project, requiring the involvement of IT support staff.

5.3 CD-ROM output

When the final XHTML files for the subject guides were published, they could be transferred onto a CD-ROM

in the same folder structure in which they were filed on the Web server. It was found that some CD-ROM specific text was required on some pages and it was a relatively straight forward task to create specific components for such text and add them to the specific page collections and republish the files.

Problems with CD-ROM output were not related to the mechanics of the CM approach but to the inherent limitations of publishing content on a static medium, previously mentioned. Inevitably, online resources referenced in subject guides experience changes in authentication systems or URLs. One major resource happened to be in the midst of this transition whilst the CD-ROM was being developed and it was not clear what the final access method would be. As the CD-ROM had to be sent off for replication before the issue would be resolved, the developer decided to insert some warning text by all instances of the resource in the Guide and, rather than provide a resource URL which might be incorrect, used the URL of the equivalent *online version* of the Guide page instead. The student would therefore select the resource link and, once connected to the Internet, be presented with a mirror image of the page s/he had just left and would need to click the resource link again to gain access!

With hindsight, the Library should have worked with the supplier of the resource in question to create a redirect Web page on their server for those students using the old access route. However, it did call into question, yet again, the value of providing an ever-changing subject guide on a static medium, especially if students had to go online to use most of the resources included. This experience, more than anything else, caused the subject librarians involved to subsequently abandon subject guide output on CD-ROM.

5.4 PDF output

The final stage of the project was intended to be an output process that would convert the XML data into a basic formatted PDF document with standard page and section headings, page numbers and a table of contents. It was hoped that this would be ready in time to produce some printed guides for the next presentation of a particular Technology project course presenting in April 2003. Unfortunately, due to resource and time constraints, it proved impossible to generate an acceptable automatically generated document for student use. Sections appeared out of order, text went missing, format headings were inconsistently applied and pagination was incorrect. An editor ultimately had to be employed to manually correct the output to such an extent that no efficiency savings were achieved compared to the previous process that used manually edited Word documents.

6. Review

There is no doubt that the practical realities of the design and implementation stages were extraordinarily complex and that this ultimately affected the long-term viability of the project. Leaving aside the not insignificant intellectual effort in deciding what to include on a given subject guide page and how best to abstract/describe it, in order to do even the simplest task, the librarian had to ultimately grapple with at least six different views (or versions) of the same data:

- that of the original online guide;
- the Tridion component template view;
- the Tridion folder view;
- the Tridion page component view;
- the XHTML output on the development Web server
- the live Web server version.

A tremendous amount of concentration was therefore required to interact with the system and make changes.

The lack of a WYISWYG front-end significantly impacted on the ability of non-technically trained librarians to use the system to make subject guide modifications and additions quickly. In contemplating the creation of a new page, the librarian would only have two options:

- design the page in another package (e.g. MS Word) and then deconstruct it into individual components for cut and paste input into Tridion, before reconstructing the various components back together into component collections in Tridion for eventual output;
- design the page somehow 'bottom up' by inputting components directly into Tridion and organising them cohesively into as many sub-collections as required to ultimately build a new page.

Unfortunately too, the subject guide CM project was only able to focus on reducing the amount of duplicate content produced for subject guides and did not consider the same content held in other Library systems, notably the Library Management System (Voyager) [6], the ROUTES database of Web sites [7] and the Safari

online information skills tutorial [8]. In the context of OUL CM, combining unique data from all of these systems along with third-party subject content from supplier systems to produce multi-format subject guides would have been the Holy Grail.

7. Conclusion

The problems and limitations experienced with this project ultimately resulted in the decision taken by the OUL and LTS in 2004 to abandon the Tridion CM system developed for subject guide production. The subject guide content was migrated back into a static OUL Web site template [9] as a short-term solution – an ironic return to the cottage industry approach that the project had attempted to move away from.

The Business and Technology subject team supports four subject guides at the time of writing (all online) but printed guide production continues in other teams. The next stage in subject guide evolution at the OUL will undoubtedly witness the integration of multimedia elements to provide interactive examples of academic literature searches, bibliographic management software use (e.g. RefWorks [10] and EndNote [11]) and online database searches. Commercial software to produce such material is now available, e.g. Macromedia's Captivate [12] and TechSmith's Camtasia Studio [13] and some academic libraries are already producing online training materials with it, notably Northumbria University Library.

The ability offered by this software to add audio commentaries, interactive quizzes and/or visual elements will not only help libraries engage their users with the content and thereby facilitate skills development and knowledge transfer but it will also satisfy the obligations of UK academic libraries with regard to the requirements of the Special Educational Needs Discrimination Act 2001.

The original project aim of delivering multipurpose subject guide content into multiple formats for multiple uses is still sufficiently attractive to justify the continual exploration of CM for this work, not just for the needs of the OUL but also for other CM applications in the OU and the university sector as a whole. Indeed, it will be revisited again within the next two years when the OUL Web site and its underlying architecture are completely redesigned, partly in anticipation of the implementation of the OU's new virtual learning environment (VLE). An XML-based approach is highly likely.

A joint paper issued in 2003 by UK eUniversities Worldwide and the Society of College, National and University Libraries (SCONUL) (2003) implicitly supports this assertion. In order to ensure '...optimum integration between the delivery of course materials and information support...', the paper calls for discussions relating to: 'technical platforms for delivery of information; the media mix used to package the information; the balance between physical and electronic routes to information'. A CM approach in all but name.

Note: The article develops a presentation originally delivered to the Annual Conference of the British Business School Librarians Group (BBSLG) at the Said Business School, Oxford, April 2003.

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