Cataloging Internet Resources: Why, What, How

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ABSTRACT

Internet resources have brought great excitement but also grave concerns to the library world, especially to the cataloging community. In spite of the various problematic aspects presented by Internet resources (poorly organized, lack of stability, variable quality), catalogers have decided that they are worth cataloging, in particular those meeting library selection criteria. This paper tries to trace the decade-long history of the library community's efforts in providing an effective way to catalog Internet resources. Basically, its objective is to answer the following questions: Why catalog? What to catalog; and, How to catalog. Some issues of cataloging electronic journals and developments of the Dublin Core Metadata system are also discussed.

INTRODUCTION

The Internet, although heavily used by researchers for almost three decades, was only introduced to the public in the early 1990s when personal computer prices became very much affordable. It brought to public use an unprecedented wealth of information and became a factor in the way libraries organize and retrieve information. Libraries not only could not ignore its presence but also had to find a way to harness this new force and integrate it into their existing treasures of human knowledge. This paper tries to trace the decade-long history of the library world's efforts to catalog the information resources available on the Internet. It is by no means a comprehensive review of the literature available (for such a review, see WOODWARD, 1996). Only landmark reports and journal articles with a clear focus on the technical issues of cataloging will be included. And cataloging here means formal library cataloging. Organizational issues, such as cataloging department restructuring, cataloging staff training, etc, are out of the scope of this paper. Other papers written from systems or network perspectives are excluded also. The author simply tries to provide some answers to the most basic questions surrounding the issue of cataloging Internet resources: Why Catalog? What To Catalo? How to Catalog.

PROBLEMS WITH INTERNET RESOURCES

For librarians, and especially catalogers, whose main responsibility is to organize information for retrieval and use, the Internet has created both great excitement and grave concerns. The first concern was originated from the most important characteristic of the Internet: its dizzying growth speed. During the one-year period of the first OCLC Internet Project, from October 1991 to September 1992, the network traffic in bytes grew from 1.88 to 3.32 trillions (DILLON et al, 1993). This pace not only has not slowed down but, on the contrary, has increased throughout most of the decade. The other concern was related to the characteristics of the materials available from the Internet, which were "poorly organized, and of variable quality and stability" (LEVY, 1995). Many papers published on the topic of cataloging Internet resources during this period had some discussion about the difficulties encountered with Internet resources. These difficulties included: a wide variety of types of materials to select; the materials are prone to changes (URLs, even file format, contents, etc.) with a huge potential workload for catalog maintenance; difficulties in viewing of materials needed to do subject analysis; the cataloging work will be extremely time-consuming since no derived records are available and that means potential backlogs will be created (FLANNERY, 1995; WEIHS, 1996; SHADLE, 1997).

SHOULD INTERNET RESOURCES BE CATALOGED?

It was quite obvious that the Internet needed organization. In fact, there have been various attempts to do that (BRITTEN, 1995). However, all retrieval tools available now on the Internet have very limited capabilities, mostly because they rely on the directories and filenames assigned to the Internet electronic files,

which contain incomplete, inconsistent and nonstandard data (COCHENOUR, 1994). Cataloging is the invisible activity of libraries aimed at achieving order for effective information retrieval and use. Therefore, the first debate related to the Internet among librarians and other information professionals was focused on the viability of cataloging Internet resources. Some librarians considered Internet materials as too much unstable to be effectively cataloged (CRAIGMILE, 1995). Others wondered if increasingly powerful search and browsing tools, automated indexing tools, and 'intelligent agents' would obviate the need for catalogs (LEVY, 1995). Still other librarians came to the conclusion that, in spite of the many difficulties encountered in dealing with them, Internet resources should be cataloged like other types of traditional resources, believing that "The whole research [of Internet resources] process will be far more precise and efficient" in such a catalog (SHA, 1995). By the later 1990s, catalogers went even further in their advocating for cataloging of Internet resources, believing that the "users more and more expect to have access to these resources, so the option of leaving them undescribed and thus excluding them from the catalog is becoming indefensible" (GERHARD, 1997). Some authors have even tried to look at Cutter's cataloging principles from the perspectives of Internet resources and found that these principles were still valid but concluded that catalogers needed new methods to achieve them (MANDEL & WOLVEN, 1996). Another point in the debate was whether current cataloging tools, such as USMARC format and AACR2R could be used to catalog Internet resources. This debate ended with the findings of the OCLC Research Project in 1991-92. This landmark research project had two primary objectives: 1) to investigate the nature of electronic textual information available on the Internet; 2) to investigate the feasibility of creating MARC records for these objects using USMARC format and AACR2R. The main conclusions drawn from the project findings were that, with a few modifications, USMARC computer files format and AACR2R Chapter 9 could be used to catalog Internet resources. One of the modifications recommended was the creation of a new field in USMARC format for the electronic location and access of the Internet resources (DILLON et al, 1993; for remarks and comments on this project from participating librarians, see LEAHY & SMITH, 1992). This recommendation was subsequently approved and implemented with the creation of Field 856, Electronic Location and Access in the USMARC format by MARBI in 1994.

WHAT INTERNET RESOURCES SHOULD BE CATALOGED ?

As mentioned earlier, Internet resources came in different formats, by different modes of access and of different contents/presentations. They could be a WWW site, or a Gopher site or an FTP site. They could be census data, or survey data, or bibliographic data. They could be library catalogs or databases or electronic journals. They could be news groups, discussion groups, e-mail. Some authors tried to group them in broad categories as discrete files, databases and servers (DILLON & JUL, 1996). The question is: What should be cataloged ? Although

individual librarians representing their own institutions might have different choices of types of Internet resources to catalog, all agreed that no attempt should be made to catalog the whole of the Internet, which, in fact, would ever be a "Mission Impossible". Most librarians, especially those working in an academic environment, agree that this is a collection development issue that requires a refinement of selection policy to include Internet resources. By and large, collection librarians believe that Internet resources should be selected based on the same criteria used for other traditional materials, namely valuable for the learning/teaching/research activities. They also want them to be relatively stable. For some academic libraries, "an interim decision was made to extend this policy beyond paid items to free Internet resources" (GERHARD, 1997). With selection policy refined in this manner, the next question would be what specific types of Internet resources should be selected for cataloging. Such resources should "include, but are not limited to: online journals and books; maps; graphical materials; and multimedia materials which may contain any of these objects" (BANERJEE, 1997). For Web sites, Web pages, those of corporate nature, thus more stable and reliable, might be more attractive for cataloging purposes than those of personal nature (For a good discussion of implications for cataloging of these "link
sites", see BEALL, 1997). Data sets and Web sites providing useful statistical, census, and government information should also be considered as good candidates for cataloging, especially for the main reason that many government agencies are now putting out their publications only electronically (DOWNING, 1996; HUTTO, 1996). In short, Internet resources should be selected based on their "contents, merit, and warrant" (JUL, 1998).

HOW SHOULD INTERNET RESOURCES BE CATALOGED ?

By mid-1990s, for most librarians, the question was no longer "Should Internet resources be cataloged ?" but rather "How should Internet resources be cataloged ?". Again, part of the answer to this question came from another OCLC Internet research project. This second OCLC project, "Building a Catalog of Internet Resources", 1994-96, involved, by the end of the project, 231 catalogers representing almost all types of libraries, who volunteered to catalog approximately 4,700 Internet resources (JUL, 1998; for a view of the project from participating libraries, see NEUMEISTER, 1997). A manual, titled *Cataloging Internet Resources: A Manual and Practical Guide,* was developed by Nancy B. Olson to aid catalogers participating in this project (OLSON, 1995). The result of the project was an online catalog called InterCat Catalog, which has been steadily growing, and currently has more than 100,000 bibliographic records (102,630 as of September 1, 1999; this figure was provided in an e-mail from Erik Jul of OCLC to Knowledge Access Management Discussion Forum on September 2, 1999).

Cataloging of electronic resources (computer disks, CD-ROMs, etc.) is not something new. Catalogers have been doing it for almost two decades, using AACR2 Chapter 9, but they were dealing with static objects. With the Internet resources available by remote access, catalogers are dealing with very unstable materials. Cataloging of Internet resources, therefore, is mainly different in two areas: describing their changing characteristics and providing access information.

In the first area, the most fundamental problem is a serious lack of cataloging information necessary for description. Catalogers cannot find needed cataloging data from accompanying printed materials or containers, which are very much unlikely. The chief source of information for Internet resources will be the title screen or similar display from the terminal, which sometimes requires to be decompressed or processed in some manner. But even the title screen can change with time and with viewing means (BANERJEE, 1997). Publication data (place, publisher, and date) and edition data are rarely provided. Physical description area should be omitted since there is no physical items available (FATTIG & BLOCK, 1997). Designation of file characteristics (AACR2 Rule 9.3B and USMARC Field 256) is limited by AACR2 to just a few choices, namely Computer data, Computer program(s), and the combined Computer data and program(s) since the proposed expansion of the list of descriptors to include terms such as "Electronic journal", "Electronic document", "Bibliographic database" by OCLC after the first Internet project was deferred by MARBI (CAPLAN, 1994). Because of all these difficulties, notes may be used more in bibliographic records for Internet resources than in those for conventional materials. In many cases, notes may need to be created for: source of title proper (MARC 500), variations in title (MARC 500), edition and history of file (MARC 500, 522, 567), publication/distribution (MARC 500), file characteristics (MARC 500, 516, 565), other formats available (MARC 530, 535).

In the second area, because of the remoteness of Internet resources, notes need to be created for: system requirements (MARC 538) and mode of access (MARC 538). Finally, and most important, at least one MARC 856 for electronic location and access should be provided. This field contains data for the Uniform Resource Locator (URL) for remote access and other kinds of data and can be repeated. The Library of Congress's Network Development and MARC Standards Office has issued *Guidelines for the Use of Field 856* (LIBRARY, 1995). As URLs can change easily and frequently and this can create a huge catalog maintenance problem, catalogers need some working solutions. OCLC has developed a resolving system called Persistent URLs or PURLs. PURLs are also URLs but they do not change. They are associated with URLs that can be changed as needed (JUL, 1998). This system, however, only works for URLs from registered users.

By 1997, many academic libraries have embarked on some sort of cataloging Internet resources projects and we witnessed the publication of several project reports on the topic, a number of them dealing with cataloging electronic journals (CAMPBELL & COX, 1997; GERHARD, 1997; HOLMES, 1998; HOWELL et al, 1997; SIMPSON & BANACH, 1997; SIMPSON & SEEDS, 1998). By now, some copy cataloging for Internet resources has been made possible by source records available through the rapidly growing OCLC's InterCat Catalog.

In the meantime, in 1994, the international library community, through IFLA (International Federation of Library Associations and Institutions), started reviewing the International Standard Bibliographic Description for Computer Files (ISBD(CF)), which was first published in 1990. The whole process took three years to complete and the new International Standard Bibliographic Description for Electronic Resources (ISBD(ER)) was published in August 1997 (BYRUM, 1998). Many important changes were incorporated into the new standard: Electronic Resource was replacing Computer File as General Material Designation (GMD), the section on Type of Resource was completely reworked to improve its usefulness, with a total of 30 terms representing 3 levels of specificity, just to mention a few (SANDBERG-FOX, 1998). The functionality of the new elements of the ISBD(ER) within the framework of the Functional Requirements for Bibliographic Records (FRBR) was examined and found adequate (MURTOMAA, 1998). (For some practical experience in cataloging CD-ROMs using ISBD(ER), which is out of scope of this paper, see WITT, 1998). The Joint Steering Committee for Revision of AACR (JSC) has decided to bring AACR2 into harmony with the ISBD(ER). Recommendations towards harmonisation from a task force of the ALA Committee on Cataloging: Description and Access (CC:DA) will be considered at the JSC meeting in October 1999 in Brisbane, Australia.

ELECTRONIC JOURNALS

Among Internet resources, electronic journals, by their contents, are the ones that have been increasingly attracting librarians' attention. Either their attention was originated from problems in serials cancellations (RABINE et al, 1998), or in reduced serials staffing level (HOLMES, 1998), everyone had electronic journals on top of their choice lists of Internet resources to be cataloged. Most serials catalogers gave top priority to paid electronic journals through either institutional subscriptions or consortial license agreements, and, of course, higher priority was given to those providing access to full text than to those providing only abstracts or tables of contents.

Before MARC format integration, the first institutional decision to make was how to treat electronic journals: as serials or as computer files (THORBURN, 1992). Now, after the format integration was completed and after MARBI redefined

leader/06 code "m" in June 1997, almost all electronic journals will be coded "a" and include a serial 008 field and a computer file 006 field (BECK et al, 1998).

The next policy decision for libraries that catalog electronic journals would be: one record for both print and electronic versions, or two records, one for the print version and one for the electronic version. CONSER prefers separate records for the CONSER database, but CONSER also allows member libraries to create just one record for the print version with notes showing the existence and electronic location of the online version (for a good discussion of this issue, see HIRONS, 1997). Libraries are still divided on this issue, some like University of Texas at Austin Library following the one-record policy (HOLMES, 1998), while others like Pennsylvania State University Library preferring the two-record policy (SIMPSON & SEEDS, 1998). Many libraries adopt the mid-way policy, creating just one record for journals whose print and online versions are identical (this could become a problem since publishers tend to add more contents into the online versions), and creating two records for other kinds of journals.

In either case, bibliographic records for electronic journals should contain these additional MARC fields: 500 for Source of Title; 516 for Type of Computer File or Data; 530 for Additional Physical Form Available; 538 for System Details; and, 856 for Electronic Access and Location, containing a URL. In the one-record option, a MARC 776 (Additional Physical Form Entry) and a MARC 730 (Added Entry - Uniform Title) or 740 (Added Entry - Uncontrolled Related/Analytical Title) may be also needed. Serials catalogers also have to decide what specific URL should be put in MARC 856: the one that leads directly to the journal or the one that leads only to the publisher's homepage. In case of doubt, it would be wise to provide multiple 856s (HAWKINS et al, 1998).

Another issue in cataloging of electronic journals that needs to be looked at is the level of description provided. Because of the fact that their characteristics keep changing (and this is also true with electronic documents in general), many authors wonder if it is really worth providing a full description, that ultimately adds to the already heavy workload in catalog maintenance for printed serials. They suggest instead a briefer "access record" along the line with records in the ISSN (International Standard Serial Numbers) network database (SIMPSON & SEEDS, 1998).

METADATA AS A SOLUTION?

Although cataloging Internet resources is now a reality in many libraries, the problem of bibliographic control of the Internet remains far from resolved. The library profession efforts have been focused only on the output of the networked information flow. Some initiatives are needed at the other end of the flow. Metadata systems and schemes have been created for this purpose, i.e., providing Internet resource creators with a working mechanism to embed

resource description elements in their products. These elements will help in the discovery and retrieval of Internet resources. In fact, a study, carried out on nine Internet search engines, has found that "they commonly cover data contained in fields identified by the <HEADER>, <TITLE>, and <HREF>MTML tags" (CLEMSON, 1997). Among these various systems, the Dublin Core (DC) has gained the most attention from catalogers. The attraction to DC lies in its universality as a "switching language" and in the fact it has evolved with strong support and participation from OCLC (for a good introduction to DC, see HAKALA, 1997; for more information about DC, especially news of developments, projects, see the DC Homepage at: http://purl.oclc.org/dc/). The library community has seriously looked into the applicability of the DC in cataloging. A Dublin Core/MARC crosswalk (or mapping) was done by Library of Congress (LIBRARY, 1997). The Committee on Cataloging : Description and Access of the Association for Library Collections and Technical Services (a Division of the American Library Association), has created the Task Force on Metadata and the Cataloging Rules, to evaluate two metadata element sets (TEI - Text Encoding Initiative, and DC) as a source of cataloging. The Task Force, in its Final Report, has recommended that ALCTS continue to monitor metadata developments, through the new Joint Task Force on Metadata with MARBI, for their potential impact on library catalogs and cataloging (ASSOCIATION, 1998). The Nordic Metadata Project has gone a step further in creating the DC To MARC Converter, which "is capable of producing records in USMARC and all Nordic MARC formats from Dublin Core source data" (NORDIC, 1999). The Converter is now available at this URL: http://www.bibsys.no/meta/d2m/. It could become a very important copy cataloging tool in the future, if Internet resource creators embed DC elements in their products. Some authors have already started talking about a four-tiered Internet cataloging scheme, in which DC-based records will have some role (ODER, 1998). Taking one step further in this direction, one author has suggested the integration of the three tasks of cataloging, indexing and markup editing at the creation step of the electronic documents so that "the cataloging records exist with(in) the electronic source files" (JENG, 1996).

CONCLUSION

Internet resources have brought new challenges to libraries. The cataloging community has accepted these challenges and has embarked on various innovative ways to incorporate these valuable information resources into the online catalogs. Most academic library OPACs now provide their users with access to various types of electronic journals. The problem of bibliographic control of the Internet, however, is still far from resolved. In the short term, the approval by the JSC of the CC:DA task force's recommendations towards harmonization with ISBD(ER), which are expected at the upcoming JSC meeting in Brisbane, will undoubtedly improve the descriptive cataloging of Internet

resources. Metadata systems, especially the Dublin Core, could be the answer in the long range.

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