



**STANDING COMMITTEE ON AUTOMATION
TASK GROUP ON LINKING ENTRIES**

FINAL REPORT

Feb. 2005

INTRODUCTION

At the CONSER At-Large meeting at ALA Midwinter in New Orleans, Jan. 20, 2002, a panel consisting of Kathy Tomajko, Assistant to the Dean of Libraries at Georgia Institute of Technology and secretary of the Reference and User Services Association, and Julie Gammon, Head of the Acquisitions Dept. at the University of Akron, acted as representatives of the reference and acquisitions communities in field questions regarding CONSER and serial records. The first question put to them was, "If you could have your way, what would you change about how serials are cataloged?" As part of her response, Tomajko noted problems with linking relationships as expressed in OPAC's. She declared that one librarian had said that returning to the days when such changes were labeled as "supersedes" and "superseded by" would be an improvement over a current display labeled "another title." Tomajko also said that in some catalogs all that appears are the links, rather than the displays that are supposed to be generated from those fields."

This discussion was continued at the annual meeting of the CONSER Operations Committee in May of 2002. According to the minutes of that meeting, "Reference librarians cited numerous problems with the multiple successive entry records for serials in OPACs and it was suggested that CONSER develop guidelines for the use and display of linking fields. The basic problem is that even though linking information exists on bibliographic records it is not always fully used in local OPAC displays. Some systems provide more sophisticated abilities to display this information than others. But it was noted that even when the system can produce hot links, reference staff and patrons fail to use them. Several systems, including III, Voyager and VTLS, were mentioned and their varying ability to display this information. VTLS in particular was mentioned for its interest in developing cascading displays of linked records." At the conclusion of that discussion, it was decided that "CONSER will request that the Standing Committee on Automation set up a new task force to explore the current uses that ILS's are making of links and to provide guidance to libraries in how they can best take advantage of links during implementation."

Pursuant to this request, the Standing Committee on Automation organized the Task Group on Linking Entries.

CHARGE

The task group was assigned the following charge:

1. Examine how ILS's make use of linking entry fields in records for serials and other resources and establish criteria for assessing their effectiveness in handling this data.
2. Determine the types of functionality that are needed to use such links effectively.
3. Develop a list of "best practices" for ILS's in making use of linking entry fields in order to optimize access.
4. As appropriate, consider the recommendations of the JSC task group on expression level cataloging in regard to links and how these recommendations might impact on the work of this group.

MEMBERS

The members of the task group were as follows:

- Michael Charbonneau, Chair
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- Gary Charbonneau
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ACKNOWLEDGMENTS

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BACKGROUND

“Linking entry fields,” *per se*, are not defined by the cataloging rules. They had their origin in the rules as nothing more than a particular kind of note – a note to appear, originally, on a typed or printed card in a card catalog. Only when such notes began to appear in coded form in Machine Readable Cataloging (MARC) records, and those records in turn began to be displayed in online public catalogs rather than printed on cards, did the function of providing machine linkages become relevant. Even today, “linking entries” are not identified as such in the *Anglo-American Cataloguing Rules. AACR2*, 2nd ed. 2002 revision, refers to this information as “relationships with other resources,” and prescribes, “Make notes on the bibliographic history and on important relationships between the resource being described and the immediately preceding, immediately succeeding, or simultaneously issued resources” (Rule 12.7B8).

It is only when we turn to standards for the machine coding of cataloging records that we find a definition and summary of linking entries. According to the *MARC 21 Concise Format for Bibliographic Data*, “[A linking entry field] identifies other related bibliographic items. Each of the linking entry fields specifies a different relationship between the [target item](#) described in the record and a [related item](#). These relationships fall into three categories: 1) related items that assist the user in continuing to search but are not physically required to obtain the target item (e.g., former entries for continuing resources, translations of the target item); 2) related items that have to be obtained physically in order to use the target item (e.g., the [host item](#) for a [component part](#): a journal issue containing a specific article); 3) related items that are [constituent units](#) of a larger whole (e.g., the individual photographs contained in a visual material collection). The linking entry fields are intended to generate a note in a display of the record in which they appear; provide machine linkage between the bibliographic record for the target item and the bibliographic record for the related item, if the related item is covered by a separate record; and/or facilitate indexing.” Today there is great interest among the public in linking – in linking from within the catalog to external resources, from external resources to the catalog, and from one record in the catalog to others. Users are used to being able to link quickly to the information they want, and their expectations are very high.

In addition, an automated system could use the information from linking entries to construct an online display of the “genealogy” of a serial, to make the relationships of the various titles under which it may have been published during its lifetime more clear to the user. This possibility is more thoroughly discussed in Frieda Rosenberg’s paper for the Task Force on the Uses of a Publication History Record, presented at the MARC Formats Interest Group at the 2004 ALA annual meeting in Orlando, as well as at a recent CONSER meeting. A draft summary of this paper is available at:
http://www.lib.unc.edu/cat/mfh/serials_approach_summary.pdf

Additional discussion will occur later in this report.

Thus, the three functions of linking entry fields in an OPAC are, or could be:

1. To generate notes, and
2. To allow the user of the catalog to “hot link” from one bibliographic record to one or more different bibliographic records in the same catalog for related works, and
3. (Possibly) to enable an automated system to create alternate displays of bibliographic information that would enable users to find what they want more quickly and efficiently than the display of individual bibliographic records tied together by notes (logical links) or hot links.

The implication behind Tomajko’s comment at Midwinter 2002 and the discussion at the CONSER Operations Committee meeting in May 2002 is that certain OPACs by certain vendors may be at fault in preventing linking entry fields from performing their intended functions adequately. These limitations may also impede future enhancements.

The task group would like to note at this point that the evidence of what OPAC users need or want in terms of linking entry functionality is largely anecdotal. We do not have any empirical data that would tell us which end users make use of linking entry fields, when they use them, or why they use them. We *believe* that public users of an OPAC are most likely to need linking entry information when they come to the catalog with a citation in hand pointing to a specific issue of a specific volume of a serial title, only to find that the catalog record for that title does not show that issue to have been part of the published run of the serial under that title. In other words, the need is most likely to arise when the user has a citation to the serial under its earlier or later title. The problem is exacerbated by older records in many catalogs, since earlier conventions prescribed more successive entries for smaller changes. Perhaps even more serious is the fact that information about title changes is rarely, if ever, displayed to the user in direct conjunction with holdings displays. When a title changes, holdings under a later form of title may appear to materialize out of nowhere, while holdings under an earlier form of title may seem to disappear into thin air. The user must refer back to the body of the record for an explanation, which is then often unclear.

The task group understands its assignment to be to recommend how OPACs might make best use of successive entry cataloging and of existing records. Latest (or earliest) entry records would eliminate some serious linking entry issues, but would raise a completely separate set of issues.

LINKING ENTRY FUNCTIONALITY OF MAJOR VENDOR OPACS

In mid-2003, task group members conducted an informal survey of major integrated library systems in order to develop an understanding of how these systems handle linking entries. The survey was non-systematic and impressionistic, and the results have not been included in this report.

Appendices 1-6 illustrate the staff and OPAC views, in particular implementations of these systems, of the title, *Saturday review* (New York, N.Y.: 1952). The task group warns that it is dangerous to draw too many inferences from specific examples. Because OPAC displays tend to be highly customizable, the results might be different in an implementation of the same system at a different site. And of course they might also be different on the same ILS at a different release level if relevant functionality has changed.

“BEST PRACTICES” FOR LINKING FIELDS

As indicated earlier in this report, the three functions of linking entry fields in an OPAC are, or could be:

1. To serve as notes, and
2. To allow the user of the catalog to “hot link” from one bibliographic record to one or more different bibliographic records in the same catalog for related works, and
3. (Possibly) to help enable an automated system to display the full history of a serial publication.

Each of these functions or possible functions will be discussed separately below. There is actually a fourth possible function, and that is to serve as access points. However, the task group feels that the use of linking entry fields as access points is problematic, for a reason discussed later in this report. Consequently, we have chosen not to list it separately here.

Function 1: To Serve as Notes

There is no controversy that any OPAC should be able to present linking entries to the user in the form of intelligible notes. In this regard, the current generation of integrated library systems does a fair job (though it could be better).

Modern OPAC bibliographic displays are generally implemented with the use of field labels, such as “Title:”. Some or all of the data in the field is displayed following the label. What label is to be used for each field is defined on a field-by-field basis. Thus, the system knows that when it displays the data in a 245 field, it should do so following the label, “Title:”. In the present generation of automated systems, customers have a good deal of flexibility in determining what the label should be for a given field. The task group encourages this flexibility, noting only that the flexibility to choose a good label for a field implies the flexibility to choose a bad one. If, therefore, some of the labels in a given catalog are

confusing or poorly understood, that is as likely as not to be the result of a poor local implementation, and is also as likely as not to be something that can very easily be corrected by a simple modification to a configuration file.

The fields used for linking fields present something of a special case, in that the proper labels cannot necessarily be generated based on tag numbers alone. Indicator values must also be considered. The first indicator determines whether or not the contents of the field should be displayed in the OPAC at all. If the value of the first indicator is “1,” then no note should be displayed. In most cases, a different note should be displayed in this situation, the note to be found in a 580 Linking Entry Complexity Note field. It should be pointed out, of course, that in those cases where a 580 field is used, and the corresponding 7XX field or fields are not displayed because of the setting of the 7XX first indicator, the ability to hyperlink is subverted. Logically, one cannot hyperlink from a field that is not displayed.

Some consideration may need to be given to the implications of this fact in its coding conventions. MARC 21 describes the use of second indicator “1” in fields 760-787 as follows: “Value 1 indicates that a note is not to be generated from the data in linking entry field (or from the related record). Value 1 is used when the display constant associated with the linking field does not adequately describe the relationship. In this case, a note for display is recorded in field 580. The 760-787 field is recorded to provide the machine linkage and field 580 is used for display.” The “machine linkage” cannot provide a clickable OPAC linkage if the display of some 760-787 is suppressed because of the presence of value 1.

This problem arises from the history of cataloging convention rather than from the automated display of the cataloging. As explained in the *Background* section of this report, *linking entries* are an offshoot of the machine coding of catalog records. While bibliographic records morphed from solid entities on catalog cards into fluid fields of malleable data, librarians simply transposed convention from one medium to the other. Practices designed for card catalogs continue to be followed in online catalogs.

The underlying assumption that display of a linking entry field is not necessary if a natural language note is recorded elsewhere in the record is a holdover from the earlier practice of machine coding records to print notes on catalog cards. A note appearing on a catalog card identifying a related title in such a way as to facilitate retrieval by a patron (i.e., to send the patron on his way to some other drawer in the card catalog) was for all intents and purposes the most that the card catalog could do to provide a “link” to the related title. This is not true in the online environment, where linking entry fields offer the capability to take the patron directly to the related record.

While the MARC format was and is powerful, some complex relationships could not easily be conveyed through the linking entry fields defined in fields 76X-787. The 580 field was designed to express these relationships. Current cataloging convention prescribes (1) setting the MARC 21 linking entry field first indicator value to “1” to suppress the linking entry field from display when an intelligible note cannot be generated by the use of a display constant (as defined by the second indicator), and (2) recording a natural language note in a 530 or 580 field.

It is generally assumed that the second indicator in the 7XX field should determine the field label that should be associated with that field, and the ability to do this represents an OPAC “best practice.” Thus, in a 785 field, if the value of the second indicator is “0,” the label could read “Continued by:”, whereas if the value of the second indicator is “2” it could read, “Superseded by:”

While it is generally assumed that the field label should be generated from the second indicator in the 7XX, an alternative would be to generate the label based on the tag number, and to use the second indicator value to generate what used to be called, in the days of card printing, a “print constant.” In the OPAC display, the print constant could be supplied at the beginning of the data in the field in question. To the user, it would appear precisely as though it were part of the data. Consider the following example:

780 00 | t Illinois journal of mathematics

An OPAC could display this as:

Note: Continues Illinois journal of mathematics

where the label “Note:” is generated by the presence of tag number 780, and the print constant “Continues” is programmatically supplied to the display based on the value of the second indicator.

As a technique, it would in fact be at least slightly superior to basing the text of the label on the value of the second indicator, since it would get around the issue of label length. As the above example illustrates, the label could be brief, while the print constant could, in theory, be of any desired length. In reality, some limitation might be placed on the length of print constants depending on the interface that is used to define them (if the interface does not provide for defining a print constant exceeding 22 characters in length, then obviously no print constant in that system can exceed 22 characters in length).

One other advantage that the print constant technique has which may be of greater significance is that it could eliminate the need for 580 Linking Entry Complexity Notes in the case of notes involving multiple titles in multiple linking fields. Consider, for example, the note, “Formed by the union of ... and ...” There is no practical way to display this relationship in the OPAC through the use of field labels alone. However, it could easily be accommodated by display software using print constants. We know this is the case, because this is how card print programs were and are designed. In an OPAC with no print constant capability, this type of complex relationship virtually demands the use of a 580 in order to express the relationship. This in turn means that the titles identified in the note cannot be linked within the note itself, because the 580 field does not provide for that level of discrimination. The display of the corresponding 7XX fields would typically be suppressed based on the MARC first indicator value “1.” The 7XX fields could instead be displayed in the OPAC in order to permit them to serve a hot linking function, ignoring the first indicator setting. However, this would mean that the linking information would be displayed redundantly, via both a 580 and one or more 7XX’s. The 580 note would presumably be readily intelligible, but the 7XX notes would probably be less intelligible, since it is for the

purpose greater intelligibility that 580's are used in the first place. If the print constant technique were available, both titles could be pointed to by hot links without difficulty.

For these reasons, the task group recommends as a true "best practice" that OPAC displays accommodate the use of print constants in addition to field labels. At the same time, it recognizes that the introduction of this capability may not become a high priority with system vendors, given that the field label technique will successfully accommodate the most commonly used linking entries.

Appendix 6 illustrates an actual example of an OPAC display that makes use of the print constant technique.

The use of linking field |i for notes specifying the "display text" in all linking fields except 780 and 785 will help reduce the need for 580 notes in the future. However, not all systems are currently able to make use of this subfield, and the 580 will still need to be used in the appropriate situations in conjunction with fields 780 and 785.

Function 2: To Serve as Hot Links

The task group recommends as a "best practice" that OPAC users be able to click on the entry for a title in an OPAC and be taken immediately to another record in the OPAC that corresponds to that title. If a corresponding record is not available in the catalog, the OPAC should be capable of providing an appropriate message to convey the information that the title is not held.

The present generation of OPACs already provides a version of this functionality. Current OPACs generally use the data in linking entry fields to perform another search in that OPAC. The user is presented with a clickable link. When the link is clicked, the system initiates and executes a search, typically in an all-purpose title index. This is not "true" hyperlinking, but rather "pseudo-hyperlinking," because it does not actually provide for a logical link between records.

One problem raised by pseudo-hyperlinking is that there may be no documents (records) retrieved by the link. This problem frequently occurs on the web, of course, since the document pointed to by a web hyperlink may have moved to a different address, or may no longer even exist. In the pseudo-hyperlinking environment of an OPAC, it occurs most often for an entirely different reason: the library does not own the title described by the link. Thus, there is no record for the link to point to, may never have been such a record, and may never be such a record in the future. The failures of web hyperlinking are non-systematic and accidental. The failures of pseudo-hyperlinking are systematic and deliberate and, therefore, are less acceptable.

In current major known systems, the search is only a title search (|t or sometimes |s). In a more fully developed system, the system might take the data from |x in a 780 field and use it to search an ISSN index, or at least perform a keyword search on ISSN where ISSN can be found in a general keyword index. Other control numbers available for searching, but found in these fields with varying degrees of frequency, are Library of Congress control numbers,

bibliographic utility record numbers, and local record numbers (library supplied in local subfields). Each of these is a unique number that should retrieve only one record, except in shared catalogs where duplicates are permitted. It should also be noted that, if a related records exists in the catalog but has no ISSN, that record would be missed by any hot linking functionality utilizing ISSN only.

The possibility of searching by control numbers embedded in linking fields has an implication, not only for system functionality, but also for indexing. Just as automated systems allow a good deal of flexibility when it comes to defining field labels, they also allow for a good deal of flexibility when it comes to deciding what to index, and what indexes to define. A library can use its system's flexibility to make bad decisions about field labels, and it can also use its flexibility to make bad decisions about indexing. A bad decision about field labels is quickly correctible; it is likely to take much longer to decide to change a label, and decide what to change it to, than it is to make the actual change (which may well take effect dynamically). Redoing a bad indexing decision, on the other hand, is more difficult, since it could involve re-indexing an entire database. This type of re-indexing is not likely to be something that large libraries with large collections can do at any time, since it might be necessary to take the OPAC down to accomplish it. A library may only have the luxury of re-indexing once or twice a year (or even less frequently) depending on whether re-indexing can be done without vendor assistance or intervention, how long it takes, and the demands of the library's clientele for continuous access. In an academic library, for example, the academic calendar may preclude re-indexing at will.

In addition, it should be noted that what gets indexed will obviously have an impact on how hyperlinking functions. For example, if hot linking functions off an ISSN index, then the content of the ISSN index will determine how hot linking works. ISSN's can be found in 022 fields. They can also be found in |x subfields of linking entry fields. If ISSN's from |x subfields are thrown indiscriminately into an ISSN index with ISSN's from 022 fields, the likely result will be circular links, with records functionally linking to themselves in the OPAC. For example, a user clicks on a link in the OPAC. This causes an ISSN search to be executed. One of the records returned as a result of the search – perhaps the only record returned as a result of that search -- is the record that the user was looking at in the first place. Thus, the ISSN's from linking entry 7XX |x subfields should not be included in a linking entry ISSN index, in order to avoid circular links.

A related issue is that libraries must be careful in how they choose to index title subfields from linking entry fields. The task group feels that it would be wise not to include the title subfields from linking entry fields in title OPAC-searchable title indexes, as catalog users might view a record retrieved by a title-search hit against a 7XX linking entry field as a false hit. They are typically looking for the record for a particular title, not for the record for a particular title plus the records for titles that might happen to be related to it. There are, to be sure, tradeoffs. For example, if you indexed the titles from 7XX linking entry fields, a search against the middle title of a three-title cluster would retrieve all three titles, not just the one in the middle, and *sometimes* that could be useful. One task group member notes that her institution fought bitterly over the indexing of 76X-78X title subfields during a migration ten years ago, when it compromised on indexing "some" linking field title subfields; during its most recent migration, everyone agreed not to index any.

If hyperlinking functionality involves nothing more than performing a new index search, there will of course be no guarantee that there will be any records at all at the other end of the link. Patrons who surf the web on a daily basis are likely to be accustomed to dead links, and thus may not find this unusual or disconcerting. Nevertheless, it is less than ideal. It would be better if a linking entry note displayed as a hot link in the OPAC if, and only if, there were a corresponding record in the OPAC. In the absence of such a record, it should neither appear to be, nor function as, a hyperlink.

Obviously this can only be accomplished if the underlying data structure is aware of the existence of the logical links between physical records in the catalog. In order for that to be the case, there needs to be some place in the data structure that records the existence of such a relationship in some way. This could be accomplished by the use of a specific subfield in 7XX fields set aside for this purpose. For the purposes of this discussion, we will call this subfield “l” [“el”], for “linking.” The task group takes no position on whether this is actually the proper coding for this subfield, or on whether it should be accorded official recognition within the MARC format. Clearly it does not exist now as an officially recognized MARC subfield. Since this hypothetical |l subfield would be strictly local, libraries that export records from their local system (e.g., to a bibliographic utility) would need to make sure that this subfield is stripped upon export.

The content of the |l subfield could be either of two different types, depending on how it might be implemented in a particular system. It could be the record ID number of a specific record within the local catalog. Or it could be a subfield that contains entirely arbitrary values indicating whether there are or are not actual records to be linked to in the catalog. For example, value “0” could indicate that there is no record in the local catalog for the title recorded in the field, while value “1” could indicate that there is a record (or possibly more than one record) in the local catalog for that title. These two techniques would work slightly differently.

If the |l subfield contained local record ID numbers, then the subfield would provide for “hard links” between specific records. The system would use the record ID number in an |l subfield to retrieve that record when the link is clicked. Because it is possible that there might be more than one local record to which a link could be made (for example, in a local catalog where duplicate records were permitted by policy rather than occurring by accident), an |l subfield functioning in this way should be repeatable. The |l subfield could be optional, not required. If no |l subfield were present in a linking field, then the OPAC should display the linking entry as a note, but not as a hyperlink.

If the |l subfield contained only “ownership” flags (“0” or “1”) signifying whether there were or were not records in the local catalog to link to, (that is, that the library owned the titles in question), then the system would still have to perform a search of an index such as an ISSN index in order to find such records. The point of such a technique would simply be to display a note in the OPAC as a hot link when appropriate (subfield |l value “1”) and to display it only as a note with no hot link in other instances (subfield |l value “0”).

This kind of |l subfield would not need to be repeatable and therefore could be defined as non-repeatable. It could be made optional, in which case the OPAC display software should

assume that any linking entry field lacking the |1 subfield contained an implicit |1 subfield with a value of “0”. In other words, any note which displays should not display as a hot link.

Alternatively, the subfield |1, as an “ownership” subfield, could be made a required subfield. Any linking entry field would have to contain the subfield and data of either value of “0” or “1”. Obviously, at the time such a subfield were implemented in a local catalog, the catalog could contain thousands, tens of thousands, or even hundreds of thousands of records with linking subfields that would need to have |1 subfields created. This could be an issue, but could probably be handled as part of a relatively routine process of upgrading ILS software. Data conversions are, after all, often required during software upgrades.

The automatic creation and maintenance of “|1” subfields would impose a certain amount of overhead on any automated systems that use them. That this overhead would be excessive is perhaps unlikely, but the possibility that it might would be a matter for concern.

Use of the “|1” technique to create hard links would be dependent for its success on the presence in linking entry fields of the data necessary for an automated system to create the links – data such as ISSN, LCCN, or OCLC number. Obviously, such data is not guaranteed to be present, and thus the creation of hard links could be hit or miss. Robert Bremer, of OCLC, has found that a significant number of CONSER records contain only one linking number when multiple numbers could have been supplied by a cataloger. The task group encourages catalogers to add all pertinent control numbers to the linking entry fields, in order to best serve users of any system that is capable of utilizing linking entry field control numbers to construct hard links. The more linking numbers a record contains, the greater the probability that a computer system would be able to find matching records in a local database and create links. The *CONSER Editing Guide* says, “Subfields |w, |x, |y, and |z [of linking entry fields include standard numbers associated with the serial title or its online record. Subfields |w and |x are critical for searching and retrieval. When linking to an existing record, input one or more of these subfields.” Perhaps the last sentence is in need of modification. The task group also notes that it would be particularly hit or miss if a system attempted to create hard links, not on the basis of standard numbers, but on the basis of title information (which might not even be unique, e.g., the title “Annual report”).

Using this technique, linking entry fields would appear as both notes and hyperlinks where that is appropriate, and as notes only where *that* is appropriate. Catalog users would not – could not – click on a linking entry note in the expectation of getting to a record if that record did not actually exist. True hyperlinking would thus be functionally superior to pseudo-hyperlinking – in theory. In practice, the promise of using linking entry fields to deliver true hyperlinking comes at a price. It might be easier for ILS vendors to incorporate true hyperlinking functionality as part of their products than it would be for their customers to make effective use of it, given the content of actual bibliographic records as we find them in utilities and bring them into our local systems. Such records might contain the data necessary for an automated system to construct a valid hyperlink (and here we are talking about unique or supposedly unique identifying numbers such as ISSN or OCLC number), or they might not. If a good deal of manual cataloger intervention at individual libraries is something that would be required to make true hyperlinking work, that is something that is so obviously undesirable that the increase in functionality over pseudo-hyperlinking probably does not justify the additional expense. If, on the other hand, a library were to implement

true hyperlinking without investing the manual effort needed to “assist” the local system in constructing the hyperlinks where it cannot construct them on its own, the hit-or-miss nature of the results would undoubtedly be much inferior, in terms of functionality, to the present pervasive use of pseudo-hyperlinking technology.

If true hyperlinking is not used, then hot linking functionality must rely on pseudo-hyperlinking, searching one or more indexes and possibly finding no matches. This is at least minimally acceptable. There was some sense on the part of the task group that, in this case, it would be desirable that the system not return its generic “no hits” message, but rather something a bit more specific. Precisely what that more specific message might say is potentially a matter for debate. Ideally, an automated system should be delivered with a suggested default message, but allow customers to customize the message easily.

Function 3: To Display the Full History of a Serial Publication

In considering alternate displays for the display of bibliographic information, the task group builds on the work of the CONSER Task Force on the Uses of a Publication History Record and its paper, “*An Approach to Serials with FRBR in Mind*” (http://www.lib.unc.edu/cat/mfh/serials_approach_summary.pdf). This paper was presented at the MARC Formats Interest Group the 2004 ALA annual meeting in Orlando, as well as at a recent CONSER meeting.

In this paper, the CONSER Task Force notes, “In the view of those working with holdings, the biggest stumbling block to the intelligent organization of information for display to users is the fragmentation of holdings between bibliographic records.” This is a crucial point. It is reasonable to assume that, when a user approaches the catalog to find a serial “work,” he or she is probably not interested in the work as a whole, but only in a particular and (more or less) well-identified subset of the work. In other words, typically the user has a citation to a specific article in a journal. Now he or she needs to locate the journal in order to find the article. The “journal” is a container of discrete bibliographic entities (“articles”). In order to locate the desired article, the user must navigate through a potential maze of records to find one or more that describe a journal container holding the desired article. If the user is lucky, he or she may be able to bypass the catalog altogether and go directly from an online citation to the full text of an article thanks to an OpenURL. In many cases, however, the catalog remains a way station through which a user must pass after obtaining an article citation in order to get to the article.

In order to facilitate this process, it might be desirable and should be technically possible for an automated system to extract information from individual bibliographic records logically linked by 7XX fields and build a text-based or graphical display illustrating the relationships among the various titles in the form of a family tree. It would certainly be a matter for debate as to how elaborate this family tree ought to be. Some might argue that the crucial relationships are the chronological ones, that the user might be primarily interested in seeing a text-based or graphical presentation of the history of a serial through its many title changes. This type of information might be most useful for the user approaching the catalog with an incorrect citation: an article is to be found, not in the journal under the title as it appears in the citation, but in the journal under an earlier title or under a later title. If a

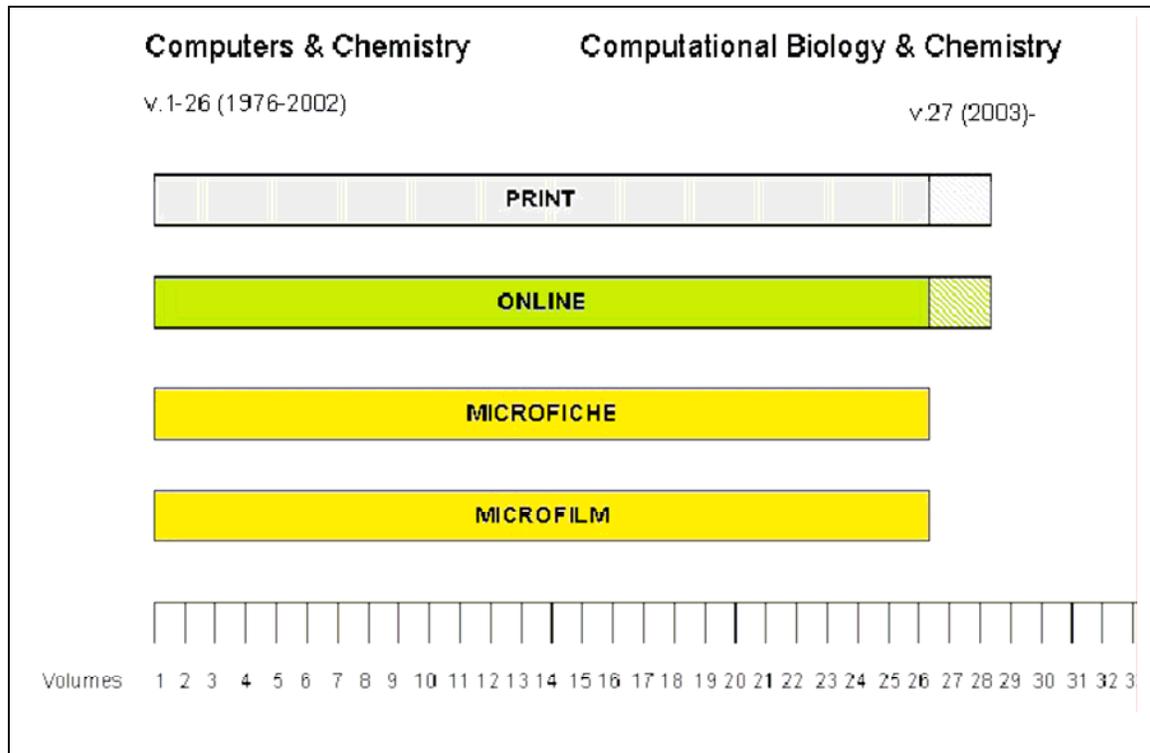
family tree of serial titles were presented along with the available holdings associated with each title, the user might have at least a fighting chance of finding the volume and issue containing the cited article.

Others might argue, however, that it would be even more important to give the user a fighting chance of finding the desired volume and issue in a sea of multiple versions -- print, microfilm, online. Obviously, the user may be able to find what he or she needs in only one version, one "manifestation," or in more than one version. Again, it might be desirable and should be technically possible for an automated system to extract information from individual bibliographic records logically linked by 7XX fields and build a text-based or graphical display to enable the user to better understand what manifestations are available and what holdings are available in the library for each manifestation.

One problem in the design of alternate displays is that the relationship between earlier and later titles is different from the relationship between multiple versions of the same work as published at a single point in time. Developing a graphical display that clearly conveys both of these quite different types of relationships among records in a catalog could be somewhat difficult. The CONSER Task Force on the Uses of a Publication History Record described these two types of relationships as "chronological" and "horizontal." It suggested that the proper means of accommodating this complexity within the catalog would be to have "super-records" which would "stand 'over' all of the component serial records in order to manage the relationships between them." Such super-records might, of course, have some kind of permanent existence within a bibliographic database. On the other hand, the CONSER Task Force noted that, "by means of programming, such records could be created in the process of searching." In that case, any super-record would have no permanent existence longer than the duration of the search session that resulted in its dynamic creation. One might then ask, however, whether there is any need for a super-record as an entity separate and distinct from the display that it generates in the OPAC. The ultimate goal, after all, would seem to be the creation of the display, and not the creation of a super-record. If the super-record is not necessary for the software to generate the display, then it would seem logical to dispense with it.

Whether or not a super-record is used to create a display, it remains to be seen how easy it would be to design the display in order to clearly present both chronological relationships and multiple manifestations. In its draft report, the CONSER Task Force presented such a possible display of a record in an international database such as the CONSER database.

TABLE 1. Example Serial Super-Record



In this display, the relationship between earlier and later titles is shown at the top along what amounts to a horizontal axis. The publication history of various manifestations is shown beneath the titles; in a local catalog, this information would be replaced with a display of the library's local holdings of each manifestation. At the bottom of the display, the volumes associated with the past published run and possible future run of the serial under its two titles are shown.

The display tells the user that the journal has been published under two different titles during its existence, that the earlier title was issued in print, microfiche, microfilm, and online, and that the later title has so far as is known only been issued in print and online versions. It also tells the user which volumes belong to which title.

It was probably the intent in this example that the colored bars for each of the various manifestations should be clickable, so that the user could be taken directly to the appropriate record in the catalog for that manifestation. Whether the "appropriate record" would be a full bibliographic display with associated holdings information or a holdings display with associated brief bibliographic information is a judgment call that might well vary from library to library and/or from system to system.

In this example, the display is *reasonably* clear. One can hope that catalog users would be able to read and interpret it correctly. Separately, the chronological relationship between titles and the “horizontal” relationship between manifestations could probably be made clearer, but there are obvious difficulties in the way of trying to present both types of relationship in a single display. The relative clarity of this particular example is deceptive, however, in that “universal holdings” are by their nature complete in that they represent all published parts. There are no gaps in holdings, and the published run can be described simply in terms of volumes. Where gaps exist and/or the enumeration/chronology data is complex, the display would be more difficult to read. In addition, only a very basic level of granularity can easily be shown graphically. How well this would translate to a holdings display in a local catalog is unclear. We would be able to tell what volumes the library appears to have, but we could not tell what issues it has from a display that only provides information about volume coverage unless the graphics were supplemented with more complete information in textual form.

CONCLUSIONS AND RECOMMENDATIONS

1. ***Integrated library systems should provide for the intelligible display of linking entry information in the form of notes.***

This has been a well-understood requirement since online systems were first deployed, and ILS's already do a good job in this regard. In cases where linking entry notes are unclear, the problem could be with a local implementation of an ILS – with the choice of certain OPAC labels, or with indexing decisions -- rather than with the functionality of an ILS itself. The problem could even be with individual bibliographic records. Unusual or complex relationships among records may demand that catalogers pay particular attention to the formatting of linking entry notes on those records to make sure that they are as intelligible as possible.

Recommendation to vendors: Implement the display of text from 76X-787 |i if you have not already done so. Consider the implementation of “print constant” functionality to make better use of the information encoded in indicator values, thus returning, in the online environment, to a technology that was designed for, and successfully implemented in the era of, printed cards, and is still reflected in current MARC practice.

2. ***Integrated library systems should provide for hot links from linking entry fields to enable users of the OPAC to find related records easily and without re-keying.***

OPAC users who spend far more time surfing the web than they do looking at library catalogs, have come to expect this kind of functionality, and rightly so. Current ILS's therefore routinely provide for hot-linking functionality. Specifically, it provides for pseudo-hot linking rather than true hot linking between records.

Recommendation to libraries: Use caution when considering the indexing of linking entries. Including the titles from linking entry fields in the same index as other titles will result in

circular references; the user will be taken back to the same record from which he or she initiated the search. In addition, when a user does a basic title search in the catalog and retrieves, not only the record for the desired title, but also the records for related (or similar but unrelated) titles as part of some title list, he or she may perceive the records for the related titles as unwelcome false hits.

Recommendations to PCC: (1) In this report, we have distinguished between what we have called “true hyperlinking” and “pseudo-hyperlinking” and have concluded that true hyperlinking is theoretically superior. However, true hyperlinking functionality would have difficulty realizing its full potential because the data necessary to construct reliable logical links in a local catalog is often absent from the records that need to be linked. For that reason, the task group is somewhat ambivalent about recommending ILS vendors consider implementing true hyperlinking as a “best practice” at this time. However, we would not necessarily discourage individual libraries from talking with their vendors about the possibility of basing pseudo-hyperlinking functionality on searches for numbers such as ISSN or OCLC number instead of title searches only.

Perhaps true hyperlinking is something that the PCC and the cataloging community as a whole keep “in the back of our minds,” as it were, for possible consideration later. What would be needed even to consider true hyperlinking a practical rather than merely a theoretical possibility would be for the substantial majority of CONSER records (and BIBCO records, where necessary) to have appropriate “standard numbers” of some kind in the appropriate subfields of linking entry fields, to allow local systems to construct hyperlinks with a minimum of cataloger intervention (ideally, no cataloger intervention at all).

(2) In order to facilitate the goal of true hyperlinking, catalogers should be encouraged to record multiple linking entry numbers in linking entry fields when known, not just one. Perhaps the *CONSER Editing Guide* sentence that implies that use of a single number is acceptable should be revised.

(3) As indicated on p. 6, the task group also recommends reexamination of the coding convention in MARC 21 that prescribes (or appears to prescribe) that the first indicator in a linking entry field be given a value of “1” when a corresponding 580 field is present. While this practice prevents redundant notes, it also defeats the goal of hyperlinking.

3. The potential of “alternate displays” should continue to be explored.

In this report we have considered, albeit briefly, the possibility of alternate displays of relationships among records/titles. Such alternate displays have the potential for displaying the relationships among related titles in a graphical fashion that is very easy to understand. Further study may be needed to determine how often such displays would be of benefit to actual catalog users, and how users would invoke them (or be prompted that they are available). The possibility that alternate displays would be of even greater benefit in clarifying the relationships between multiple versions than they are in clarifying the chronological relationships between earlier and later titles certainly suggests itself.

The task group would not necessarily discourage system vendors from experimenting with the incorporation of such displays in their OPAC products. However, the actual ability to generate alternate displays in a real OPAC is faced with the same basic problem faced by any attempt to implement true hyperlinking – in order for such a display to be generated, a system needs to know reliably what records to include in the display. And the system can probably only know that if it can deal with unique numbers such as ISSN or OCLC number, rather than trying to rely on text matching between (for example) the contents of linking entry title subfields and 245 title fields. In other words, the success or failure of alternate display technologies appears to be subject to the same primary constraint as the success or failure of true hyperlinking: the content of the records to be linked. Therefore, just as the task group does not wish to recommend true hyperlinking as a “best practice” at this time, it also does not wish to recommend the development of alternate displays as a “best practice” at this time. Again, this may be something to keep in the back of our minds for future consideration.

APPENDIX 1: Example from DRA Classic ILS*

OPAC Full Record View:

OPAC Full Record Display	
Title :	Saturday review [serial].
Uniform Title :	Saturday review (New York, N.Y. : 1952)
Publisher :	[New York; Saturday Review Associates], 1952-1973.
Subject :	American literature--Bibliography--Periodicals. English literature--Bibliography--Periodicals. Books--Reviews.
Description :	21 v., ill. ; 28-29 cm.
Frequency :	Weekly
Published :	Vol. 35, no. 1 (Jan. 5, 1952)-v. 55, no. 52 (Jan. 1973).
Notes :	Biography index Education index Reader's guide to periodical literature Split into four parts: Saturday review of the arts, Saturday review of education, Saturday review of the sciences; and, Saturday review of the society.
Continues :	Saturday review of literature
Continued in part by :	Saturday review of the arts
Continued in part by :	Saturday review of education
Continued in part by :	Saturday review of the sciences
Continued in part by :	Saturday review of the society

Both the 580 note field and 785 hot links display even when 1st indicator is "1". Display is generated from varying tags and 2nd indicators. Clicking on link sends user to retrieval screen for subfield \$t.

* Example from: University of North Carolina at Chapel Hill Libraries
<http://newport.lib.unc.edu>

MARC DISPLAY:

580 \$a Split into four parts: Saturday review of the arts; Saturday review of education; Saturday review of the sciences; and, Saturday review of the society.

785 11 \$t Saturday review of the arts \$w (OCoLC) 1775216

785 11 \$t Saturday review of education \$w (OCoLC) 1586137

785 11 \$t Saturday review of the sciences \$w (OCoLC) 1775217

785 11 \$t Saturday review of the society \$w (OCoLC) 1640612

APPENDIX 2: Example from Endeavor Voyager*

In OPAC Full Record, all control numbers display within linking fields. LC has also chosen to put ISSN in 580 notes.

Brief Record	Subjects/Content	Full Record	MARC Tags
------------------------------	----------------------------------	--------------------	---------------------------

Saturday review.

LC Control Number: 27005407

Type of Material: Serial (Periodical, Newspaper, etc.)

Main Title: Saturday review.

Serial Key Title: Saturday review (New York. 1952)

Abbreviated Title: Saturday rev. (N.Y., 1952)

Published/Created: New York, Saturday Review Associates [etc.]

Description: 21 v. ill. 30-40 cm.
v. 35, no. 1-v. 55, no. 52; Jan. 5, 1952-Jan. 1973.

Current Frequency: Weekly

Continues: [Saturday review of literature 0147-5932 \(DLC\)sf 84007172 \(OCoLC\)1777743](#)
ISSN: 0036-4983

Cancel/Invalid LCCN: 34008561

Notes: SERBIB/SERLOC merged record
Split into four parts with Jan. 1973: Saturday review of the arts, ISSN 0091-8563; Saturday review of education, ISSN 0091-8555; Saturday review of the sciences, ISSN 0091-8547; Saturday review of the society, ISSN 0091-8571.

LC Classification: Z1219 .S25

Other System No.: (OCoLC)ocm01588490

Serial Record Entry: Saturday review. New York. (1924-72) 27-5407

No display of hot link for titles with 1st indicator "1". Endeavor generates displays from varying linking tags and second indicators. Clicking on 780 linking field initiates a search of the catalog for that title.

MARC DISPLAY:

580 \$a Split into four parts with Jan. 1973: Saturday review of the arts, ISSN 0091-8563; Saturday review of education, ISSN 0091-8555; Saturday review of the sciences, ISSN 0091-8547; Saturday review of the society, ISSN 0091-8571.

785 16 \$t Saturday review of the arts \$x 0091-8563 \$w (DLC) 73640129 \$w (OCoLC)1775216
785 16 \$t Saturday review of education \$x 0091-8555 \$w (DLC) 73640128 \$w (OCoLC)1586137
785 16 \$t Saturday review of the sciences \$x 0091-8547 \$w (DLC) 73640127 \$w (OCoLC)1775217
785 16 \$t Saturday review of the society \$x 0091-8571 \$w (DLC) 73640126 \$w (OCoLC)1640612
785 11 \$t Saturday review of the arts \$w (OCoLC) 1775216
785 11 \$t Saturday review of education \$w (OCoLC) 1586137
785 11 \$t Saturday review of the sciences \$w (OCoLC) 1775217
785 11 \$t Saturday review of the society \$w (OCoLC) 1640612

* Example from: Library of Congress

<http://catalog.loc.gov/>

APPENDIX 3: Example from Ex Libris Aleph*

OPAC Full Record Display:

Full View of Record	
Choose format: Full Citation MARC	
Record 2 out of 2	
Title	Saturday review [h]
Title	Saturday review [s]
Published	Vol. 35, no. 1 (Jan. 5,
Published	New York : Saturda
Locations	All items
Location	Perkins Library ; Periodicals S254

No hot links in linking fields were observed in available Ex Libris online catalogs. Aleph complies with MARC 21 Bibliographic Format. No display is generated from linking fields with 1st indicator "1". When linking entry field data is displayed, Aleph allows local site selection of fields to implement for hot linking.

MARC DISPLAY:

```
580 $a Split into four
parts in 1973: Saturday
review of the arts, Saturday
review of education,
Saturday review of the
sciences, and: Saturday
review of the society.
```

```
780 00 $t Saturday review of
literature $x 0147-5932 $w
(OCOLC)1777743 $w (DLC)sf
84007172
785 16 $t Saturday review of
```

* Example from: Duke University Libraries
<http://catalog.library.duke.edu>

APPENDIX 4: Example from Innovative Interfaces Millennium*

OPAC Full Record Display:

The screenshot shows the MSU Libraries OPAC interface. At the top, there are navigation buttons: 'New Search', 'Export', 'Marc Display', 'Return to Browse', and 'Another S'. Below these is a search bar with 'TITLE' selected, containing the text 'saturday review new york'. To the right of the search bar are dropdown menus for 'Entire Catalog' and 'Sys'. Below the search bar, there are links for 'Record: Prev Next'. The main content area displays the following information:

Title	Saturday review [microform].
Publisher	[New York : Saturday Review, Inc.,
Description	21 v. : ill. ; 30-40 cm.
Frequency	Weekly
Pub history	Began with v. 35, no. 1, Jan. 5, 1952; ceased with v. 55, no. 52, Jan. 1973.
Lib of mich has	v.43 (1960)-v.55 (1972)
Note	Description based on: Vol. 47, no. 1 (Jan. 4, 1964); title from cover.
Indexed in:	Biography index 0006-3053 Education index 0013-1385 Readers' guide to periodical literature 0034-0464
Reproduction	Microfilm. Ann Arbor, Mich. : University Microfilms. microfilm reels ; 35 mm.
Note	Split into four parts in Jan. 1973: Saturday review of the arts, Saturday review of education sciences, and: Saturday review of the society.
Uniform ti	Saturday review (New York, N.Y. : 1952)
Continues	Saturday review of literature (DLC)sf 86091861
Split into	Saturday review of the arts (OCoLC)4216399 Saturday review of education (OCoLC)4216322 Saturday review of the sciences (OCoLC)4207467 Saturday review of the society (OCoLC)4216291
ISBN/ISSN	5215809
ISSN	0036-4983

Display generated from varying linking field tags and 2nd indicators if first indicator is "0". Display of 780/785 with 1st indicator "1", but not other tags. Clicking on linking field sends user to retrieval screen for 7XX \$t.

MARC DISPLAY:

```
580 Split into four parts in Jan. 1973: Saturday review of the arts, Saturday review of the
sciences, and: Saturday review of the society.
776 1 $t Saturday review
780 00 $t Saturday review of literature $w (DLC)sf 86091861
785 16 $t Saturday review of the arts $w (OCoLC)4216399
785 16 $t Saturday review of education $w (OCoLC)4216322
785 16 $t Saturday review of the sciences $w (OCoLC)4207467
785 16 $t Saturday review of the society $w(OCoLC)4216291
```

* Example from: Michigan State University Libraries
<http://magic.msu.edu/>

APPENDIX 5: Example from Sirsi Unicorn*

OPAC Full Record View:



Although Sirsi Unicorn offers the ability to support hot linking, this site chose not to implement it. Even if it had implemented this functionality, one could not have hot linked from this record because only 580 displays. Fields 7XX with first indicator "1" are suppressed from this OPAC.

MARC DISPLAY:

```
580          Split
into four parts with Jan.
1973: Saturday
          review
of the arts, ISSN 0091-
8563; Saturday review
          of
education, ISSN 0091-8555;
Saturday review of
          the
sciences, ISSN 0091-8547;
Saturday review of
          the
```

* Indiana University Libraries
<http://www.iucat.iu.edu>

APPENDIX 6: Example from VTLS Classic*

ADDISON VIRGINIA TECH LIBRARIES ONLINE CATALOG		Search Results	 ask a librarian
CATALOG CARD			
CALL NUMBER	AP2 S35		
Filing Title	Saturday review (New York, N.Y. : 1952)		
Title	Saturday review		
Published	v. 35-55; Jan. 5, 1952-Jan. 1973.		
Imprint	New York, Saturday Review Associates [etc.]		
Description	21 v. ill. 30-40 cm.		
Frequency	Weekly		
Note	CONTINUES Saturday review of literature .		
Note	Split into four parts with Jan. 1973: Saturday review of the arts, ISSN 0091-8563; Saturday review of education, ISSN 0091-8555; Saturday review of the sciences, ISSN 0091-8547; and Saturday review of the society, ISSN 0091- 8571		
Note	Cover date is month succeeding contents page date.		
Note	Also available in microform.		

OPAC Full Record View, Web Interface. Label “Note” is used, followed by print constant based on second indicator. No display or hot link of 78X field if 1st indicator is “1”.

MARC DISPLAY:

580		Split into four parts with Jan. 1973: Saturday review of the
		arts, ISSN 0091-8563; Saturday review of education, ISSN
		0091-8555; Saturday review of the sciences, ISSN 0091-8547;
		and Saturday review of the society, ISSN 0091- 8571
785	16	\t Saturday review of the arts \x 0091-8563 \w
		(OCoLC)1775216
785	16	\t Saturday review of education \x 0091-8555 \w
		(OCoLC)1586137