



Best Practices for Publishing Journal Articles

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Best Practices for Publishing Journal Articles

Preface

In late 2007, the number of publishers releasing journal articles one-by-one had increased substantially, and many other publishers were considering doing so. Because there are no standards, Abstracting and Indexing services were encountering a variety of issues that make it difficult for them to index and process the articles. When the National Federation of Advanced Information Services (*NFAAIS*TM) held a members-only meeting on the subject, nearly 50 people attended. The consensus was that a Working Group should be formed to develop Best Practices that might evolve into widespread industry practice. (See Appendixes 2 and 3 for a list of the members of the Working Group and a history of their consideration of the matter. Appendix 1 provides a glossary of some the terms used in this document and Appendix 4 lists related works that you might find of interest).

Journals have been in existence since 1665, when the first two were started to expand scientific communication beyond the limitations of correspondence between individuals. There was then, and there continues to be even now, a perceived need for the consolidation of articles in a given discipline or topic area. From the beginning, the intention was to facilitate and accelerate the delivery of scholarly and scientific information. The journal serves other purposes as well:

- Peer review
- Broad distribution
- Branding and authority
- Portability
- Creation of an archive of a body of literature

Even today, although articles may be released individually, they are still being published in a journal. The environment, however, is so volatile with the emergence of a variety of other information repositories, that some have suggested journals as we have known them may disappear.

Problems Needing Resolution

The NFAAIS Working Group that drafted these best practices began by identifying key problems related to article-by-article publishing:

- Identifying the article of record; handling versions in a way that minimizes confusion and provides the appropriate citation data early.
- Knowing that an issue - or a “package” of article - is complete.

- Abstracting and indexing services receiving articles published online without page numbers, while page numbers are added to another version at a later date.
- Assuring that articles are published and included in A&I services more rapidly to provide the best services to authors, readers, and libraries.
- Assuring that links are made to the article of record; other linking problems.
- Dealing with workflow issues such as the absence of regular publication dates or the receipt of articles twice - for example, when an article is released and when an issue is completed.
- Problems with citation structures - missing bibliographic elements, lack of standards for article-by-article publishing resulting in a hodge-podge of practices, no standard for handling articles that do not have page numbers.

Although problems emanating from article-by-article publication stimulated their work, it became clear that it was important to articulate some Best Practices that would apply to any journal article. The Working Group subsequently developed the following recommendations.

Links to Draft Best Practices

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1. Affirmation of the Journal

Primary Publisher

The journal is an essential component of scholarly communication.

- Although articles from individual journals and journal issues or compilation of articles may be presented in a database or other compilations, they should be clearly identified with the journal in which they are published.
- Journal articles published on an article-by-article basis or sold individually should be explicitly connected to the journal that accepted the article for publication.
- When there is any change in the journal title, the publisher should provide a formal notification, which can take the form of an RSS feed.
- The metadata for a journal title should be consistent.
- Each journal title should have a unique [ISSN](http://www.issn.org) (International Standard Serial Number) registered for it. The preference is to follow recommendations issued by the ISSN International Centre (www.issn.org).

Secondary Publisher

Abstracting and indexing services should include the journal title as a source for all articles published in the journal.

Related Practice

If an article that is published in a peer-reviewed journal is placed in another repository, that repository should be considered to be a complementary tool, and the article should include links to the authoritative version of the article as presented by the publisher of the journal.

Background

With the advent of electronic publishing that has resulted in the creation of large databases of journal articles, article-by-article publishing, transactional sales of articles, and repurposing of articles, the journal's identity can easily be lost. Yet the journal is the key element in assuring quality in scholarly publishing. Authors may want their work easily retrievable from a database, or even multiple sites; however, the reputability of their work depends on the quality of the peer review, which is directly associated with the branding of the journal.

Journal titles may change over time in response to changes in a discipline or a change in ownership. Publishers who place a table with a title history for each journal on their web sites provide a very useful service to end users, librarians, and other interested parties. This table should include all changes: "Title changed from _____ to _____ in (month and year)."

It does not seem reasonable to expect primary publishers to provide a separate notice to abstracting and indexing services regarding title changes. Boxing an announcement in the journal itself and including a notice in RSS feeds should suffice as notice.

In 2008 the ISSN standards indicate that separate ISSNs should be assigned to separate formats, such as print, online, and CD. ISSNs are assigned at the journal title level to provide a unique identifier for the title. The assumption is that the different formats result in different products with the inclusion of links, supplemental materials, etc. In September 2008, the ISSN International Centre released a table for the ISSN-L (or ISSN-Linking). This umbrella ISSN is intended to link to all other media for the same journal title. One of the purposes is to enhance

the success rate of results for links in the OpenURL. The ISSN-L is codified in the ISO standard 3297-2007, which updated the 1998 ISO standard (3297-1998) on ISSN.

To further protect the identity of the journal, primary publishers may want to consider registering a DOI for the journal title. Doing so would establish their DOI as the authoritative one for that journal.

2. Article Retrieval

Primary Publishers

The [DOI](#) is the standard for automatic retrieval of articles.

- All primary publishers should assign a DOI to each individual article.
- Publishers should follow industry conventions to assure that this DOI is indeed a perpetual identifier. For example, if the journal changes ownership, the DOI should be updated and maintained with the DOI organization to preserve a solid link.

Secondary Publishers

Abstracting and indexing services should include DOI links in the record for each individual article.

Background

All individuals engaged in the publication of scholarly material have a vested interest in enabling easy and rapid article retrieval. [URLs](#) are notoriously unstable; broken links are increasingly common, and the older a document becomes, the more likely the link will become dysfunctional. To provide a stable world for electronic content, it is essential that there be a global means of access that can be consistently applied. The DOI with its underlying handle system provides the requisite stability.

DOI name ownership is assigned to the publisher whose prefix was used to create it. According to CrossRef policy (CrossRef is the major registration agency of the International DOI Foundation, <http://www.crossref.org/>), an acquiring publisher must notify CrossRef about an ownership change and must document the concurrence of the former owner.

DOIs contain a prefix, assigned by the DOI system, and it indicates the DOI registry and the original publisher. The DOI also contains a suffix, which may be any combination of numeric or alphanumeric characters. Some publishers wish to assign some meaning to a DOI; others simply use system-generated unique numbers.

Originally intended only for journal articles, the use of DOIs has been extended to other types of publications, such as books and conference proceedings, and to components of these publications. For example, publishers can register DOIs for tables, figures, or supplemental materials, any part of an article they may want readers to get to with a link. In the future, it may be desirable to include DOIs for components in abstracting and indexing records. How these components will be used is still unclear, but there is growing interest in the components. Consequently, both primary and secondary publishers need to be aware of the potential for changes in how such components are presented and linked to.

Examples

1. 10.1155/2008/237478
2. 10.1037/08902-3400.22.3.413
3. 10.1037/7388930
4. 10.1052/235687

Note: The DOIs in these examples are fictitious; however, they demonstrate some typical formats. In the fourth example, the suffix is the article identifier.

3. Version Management

Primary Publishers

A basic principle of scholarship is that articles, once published, should remain available from that point forward. However, the pressure to quickly release journal articles into the hands of the reader have prompted many publishers to release an early version, sometimes as it was accepted, sometimes as it appears when it is partially through the production process. The early version is then replaced with a finished version. The existence of multiple versions of a single article that are released throughout the publishing can cause considerable confusion.

Another aspect of version control is that all primary publishers experience the need to issue corrections. It is important that any significant change in the literature is made readily available to readers and researchers.

Still another aspect relates to articles that authors withdraw or that must be retracted. This situation occurs less frequently; however, faulty data, legal implications, or the potential for health risks can result in the retraction and even removal of an article.

The following principles are offered to provide common understanding of version management.

Date of Release

When multiple versions of a single article are released, the exact date of the release of each version becomes a key component of the metadata. Dates should include day, month, and year.

Early Publication Articles

Many publishers are releasing articles at some incomplete stage, only to release the completed articles at some later date, either within days or within weeks. These early articles have a variety of labels, such as “in press” or “as soon as publishable” or “publish ahead of print” or “preliminary version.” These version should be clearly labeled so that users will know that a subsequent replacement will appear.

Replaced Articles

If the finished article is substantially the same as the Early Publication article, it can simply be inserted to replace the original. However, this new version should be labeled clearly to indicate that it is a new version. If this is the article the publisher considers the version of record, this fact should also be noted. For example, changes in grammar and punctuation or clarifications in use of language do not generally change the substance of an article. (Note: this document distinguishes between “Replaced Articles” and “Removed Ones.” Publishers differ in their practices: some retain all versions of a single article, and some replace them.)

Changed Articles

Publishers should issue notifications of substantive changes in any article. Substantive changes are defined as the following:

- Changes in metadata
- Changes in the conclusions
- Any major factual changes, particularly changes in facts that were stated in the original abstract.

Notices of these changes should be published in the journal, and the notices should be released to abstracting and indexing services so that they can be made widely available. They should also be made available in any email alerts or [RSS Feeds](#) to all subscribers to the alerts or feeds.

For any of the three types of versions noted above, the publisher should provide precise details on version status and dates to the abstracting and indexing services. It is also useful to publish the dates in the journal itself. An example might be as follows:

- Early Publication Date April 20, 2008
- Version of Record May 21, 2008

Retracted Articles

When articles are retracted, either at the request of the author or in response to legal concerns, publishers should:

- issue a notice that is published prominently within the journal and linked to the original article.
- include the notice in any email alerts or RSS feeds.
- circulate the notice to abstracting and indexing services to assure that it is widely available and linked to the original.

The preferred practice is to retract, but not to remove the offending article from the journal. The retracted article must be accompanied by a retraction notice, which should be the object of any links. It is preferable to watermark each page in a [PDF](#) as “retracted.” The retraction notice should also be included in an [HTML](#) version. In both PDF and HTML versions, the retraction notice should be stated in boldface type at the beginning of the article.

Examples of legitimate reasons for a retraction include the following:

- Ethical infringements such as fraudulent use of data, plagiarism, false claims of authorship
- Legal concerns, including potential lawsuits
- Data that could pose a health risk
- Pervasive error or irreproducible data, not necessarily fabricated.

Removed Articles

On rare occasions publishers have found it necessary to remove a retracted article from an online journal. Examples of reasons for doing this include the following:

- Infringement of others’ legal rights
- Strong potential of legal action
- Clear evidence of defamatory language
- Data that could pose a serious health risk

Early Publication results in a higher level of removed articles, either because authors withdraw them at some stage in the publication process or because serious flaws are discovered during that process. The Early Publication article is considered an “in press article;” consequently, when it has been necessary to remove them, publishers have done so with little fanfare. However, some notice should be left in the journal and abstracting and indexing services should be notified.

If an article must be removed for any reason, the publisher should retain the metadata and insert a notice that the text has been removed. Notices should be issued to abstracting and indexing services. In addition, the publisher should retain the entire article within their archive.

Reprints

Primary journal articles may be reprinted in another journal or, with permission, as a chapter in a book. Some of the metadata will remain the same, e.g., article title, authors/contributors, correspondence information, etc. However, the journal title, volume, issue, and pagination will be different. Consequently, a DOI that will lead to the reprinted article should be registered.

Secondary Publishers

Abstracting and indexing services should create a new record for official notifications of retracted or removed articles and those that have undergone substantive changes.

- Records for errata or retractions must reflect the content of the primary publisher's notification and can be completed only if the notification has been published in the journal.
- There are two generally accepted methods of reporting an erratum or a retraction:
 - A new record may be linked to the original record and links to this new record inserted into the original so that anyone who finds one also finds the other.
 - The original record may be replaced with a completely new record that includes all the original data in addition to the information provided in the primary publisher's notification so that it is clear that there are changes.
- Abstracting and indexing services should record the removal of an article, regardless of the reason for which it was removed.

The abstracting and indexing record should indicate which version has been covered. When primary publishers provide complete publication dates (day, month, year), the abstracting and indexing record should also contain the complete dates. The preferred practice is to index Early Publication articles when they are received and then replace the original record with one for the Version of Record when it is published.

Minor typographical errors or simple changes that do not change the facts reported may be handled by issuing a corrected record.

When abstracting and indexing services cover reprinted articles, they should include information on where the article was originally published. Providing a "see record" for the original article is a preferred practice.

Background

In the digital world, publishers must juggle several priorities. There is the need to quickly release materials for use by current researchers. However, the scholarly literature is not a passing phenomenon, and publishers must be cognizant of the historical record as well. If articles are published quickly and not indexed, much of the value of speed to publication disappears. Simply releasing the article early does not assure findability. If the abstracting and indexing services were to delay coverage until the article was in final form, the early release would be much less effective.

Notifications of errors in the original article or substantive changes are not new phenomena; however, the pressure to get new articles into the literature more quickly has increased the number of articles for which changes are being issued. Releasing articles as soon as they are publishable, which in some instances may mean as soon as they are fully accepted, results in

large numbers of corrected articles. The practice also results in more removals of articles for reasons that may be different from what publishers have experienced in the past.

One supposition has been that providing an audit trail within the article itself would be sufficient to record the change. However, it is important to consider user behavior. A devotee of a journal may download an article as soon as the RSS feed indicates that the article is available. They file that article in their folder and never return to the issue. Therefore, a separate notification - both in the journal itself and in the abstracting and indexing services - is essential to make the reader aware of changes.

There can never be one hundred percent certainty that the reader will find and recognize a notification of changes. However, the odds that the reader will find the changes increase significantly when the changes are made overtly and when they are covered in the abstracting and indexing services.

Currently, not all secondary services are able to index an article twice; consequently, they may either cover only the incomplete version or correct the original record when they receive the version of record. Producing a “light” record initially and then replacing that with a completely indexed record may streamline the process.

Examples

- 1. From a BioMedCentral Journal:** This Provisional PDF corresponds to the article as it appeared upon acceptance. Fully formatted PDF and full text (HTML) versions will be made available soon.
- 2. Notices appearing just below the article title on an early publication journal.**
In Press April 3, 2008 (first presentation of the article)
Published May 10, 2008 (publication of version of record)
Retracted July 2, 2008 (article retracted and left in place)
- 3. Example of a See Record for a Reprint.**
“This reprinted article originally appeared in (Brain and Language, 2008, [May], Vol. No. 105[2], 99-111). (The following abstract of the original article appeared in record [2008-05426-006](#)).” (These are the first two sentences in the abstract; they are followed by the complete abstract that had appeared in the *PsycINFO* record for the original article. The record number is a link to the record for the original article.)

4. Supplemental Materials

Primary Publishers

When supplemental materials have been accepted to accompany an article, the publisher should clearly indicate this fact. The following are conventions for supplemental material:

- The materials may appear as an adjunct to the article or within the journal itself.
- If the material is published on the open web and not within the journal, it should be linked to and from the article using a DOI. Some publishers use the article DOI and add a suffix.
- In all cases it should be made clear that the article and the supplemental materials are connected.
- A recommended citation should appear on the supplemental materials themselves if they are textual or on the landing page for non-text content.
- File naming conventions should include the file type as an extension (See examples below).
- Supplemental materials once released should be considered part of the journal's archival record. Any subsequent changes should be clearly tracked.
- Primary publishers should provide descriptive metadata that will help the secondary publisher identify the content and format of the supplemental materials for the end user.

Secondary Publishers

Abstracting and indexing services should note the availability of supplemental materials if the primary publisher has indicated that such materials exist. If the primary publisher supplies clearly identifiable metadata including file types, it is preferable that the secondary service provide notice of the content and formats in the abstracting and indexing record.

Background

Supplemental materials are those materials that are useful to help the reader more fully understand the work presented in the article. The addition of supplemental materials help resolve a dilemma authors often face. That is, their completed work may include material that cannot be included in a print journal, such as multi-media, or that is too lengthy to fit within page limitations. When these materials are placed in or linked to from the online journal, they form an important component of the literature. They may share a DOI with the primary article or may be assigned a component DOI. Even in an all-electronic journal with no print version, supplemental materials may be useful. For example, they may offer information that is interesting and helpful, but not essential to the article. Supplemental material may offer value in being cited on its own merit.

Examples of Supplemental Material

- audio or video clips
- animated content
- oversized tables
- lengthy appendixes
- detailed intervention protocols
- data sets
- expanded methodology sections
- color figures.

Examples of File Type Extensions

- “PDF” for Adobe’s PDF format
- “doc” for MS Word document
- “rtf” for MS Rich Text Format
- “txt” for ASCII text
- “zip” for zipped files
- “cif” for Crystallographic Information File
- “pdb” for Protein Data Bank files

Examples of Two Landing Pages

1. Supplemental Material for

“Conceptualizing and Testing Random Indirect Effects and Moderated Mediation in Multilevel Models: New Procedures and Recommendations.”

Daniel J. Bauer, Kristopher J. Preacher, and Karen M. Gill

Psychological Methods, Vol. 11, No. 2, 142-163

[View article](#)

[met_bauer0009_supp1.doc](#)

[met_bauer0009_supp2.doc](#)

[met_bauer0009_supp3.doc](#)

[met_bauer0009_supp4.doc](#)

2. Supplemental Material for

“The Sources of Normativity: Young Children's Awareness of the Normative Structure of Games”

Hannes Rakoczy, Felix Warneken, and Michael Tomasello

Developmental Psychology, Vol. 44, No. 3, pp. 875–881.

[View article](#)

Files:

[DEV_rakoczy1113_supplement.pdf](#)

[DEV_rakoczy_1113_supp_video_table.pdf](#)

Note: These files contain links to mpg files for videos.

5. Content Creator

Primary Publisher

The metadata for any article should clearly credit the creator. Elements include:

- the surnames and full given names and middle initials if available of all authors who participated in the writing of the article.
- author affiliations
- institutional author and funding agency if applicable.

The preference is to provide affiliations for all authors. At minimum, the metadata should provide the affiliation and contact information for the corresponding author. Metadata for authors should include given names, surnames, and middle initials if available. It would also be highly desirable to include roles, such as author, editor, or principal investigator, in the metadata if there is a distinction.

Secondary Publisher

Abstracting and indexing services should include all author names, author affiliations, and funding agencies in structured, retrievable fields when practicable. The preference is to represent names as they are in the original document supplied by the primary publisher. If the primary publisher includes roles, the abstracting and indexing record should also include them.

Author Identifiers

When the industry has established standard identifiers for authors and institutions, both primary and secondary publishers should include such identifiers with author names and institutional author names.

Notes

- The author names and initials are used for human understanding. An author ID would be good to have for machine reading.
- It is preferable to list all authors if that is possible. It is understood that in some disciplines the number of authors may be too many to list in one citation, often numbering in the hundreds. In those cases, the journal should decide what number is their maximum and apply their rule consistently to all citations. That number should, however, be more than just two or three authors. Truncating an author list severely is an artifact of print publication, in which publishers were attempting to save pages, and the practice serves the literature poorly.

Background

A key precept in scholarly publishing is to give credit to the author and to those involved in the research. Elements used include author or contributor surname and initials or given name, country of origin, affiliated institutions, and source of funding. The National Library of Medicine differentiates between author/creator and participatory investigators (those individuals who are involved in the research, but not involved in writing the article). Currently, some secondary services use the author names as presented by the primary publisher. Others reduce all to initials and surnames to provide consistency in searching.

In the print world, publishers often resorted to using “et al” after four, five, or some other number of authors in order to save space. However, doing so really distorts the literature, making analysis of the lineage and genealogy of a body of literature most difficult. Thus, the preference is to include all authors in citations. Realistically, however, citations cannot accommodate very large numbers, sometimes hundreds; therefore, it is necessary for publishers to have some cut-off number for citation display, although the metadata should include all authors. Publishers should establish a cut-off number of authors for inclusion in citations, note it in instructions to authors, and apply it consistently. In some fields, the custom is to list an individual key to the research last; for these fields, it may be useful to retain the last author’s name if some authors are omitted in the citation.

The elements used to credit the source of scholarly information are also used for analyses, primarily for productivity and influence of citations, funding, countries, and institutions. However, it can be difficult to match authors with the papers they wrote; consequently, the accuracy of these analyses is questionable. As of the end of 2008, several groups - both organizations and individual publishers - are working on developing unique identifiers for authors and for institutions. These are daunting tasks; however, if they succeed, these identifiers will add significantly to the accuracy in crediting authors and supporters of research. When such standards are achieved, the identifiers should be added to citations and other metadata. In the meantime including the greatest amount of detail in author names will increase accuracy.

Although urgently needed, a single author identifier for each author may be difficult to achieve. The identifier would be useful, not just for common names in Roman characters, but for names in languages that use other types of characters. Westernizing names spelled in Asian languages, for example, distorts their names.

6. Indication of Length

Primary Publishers

Publishers should include the following in metadata to indicate the size/length of an article:

- If articles are paginated sequentially through an issue or a volume, include numbers of pages or page ranges.
- If articles are not paginated sequentially, include the total number of pages in the article.
- In the absence of page information, provide the number of words *and* the number of graphic elements in the article.
- For audio or video materials, indicate the length of play time.

Secondary Publishers

Abstracting and indexing services should include the metadata primary publishers provide to indicate article length in the abstract record.

Background

In the print world where the article is a physical object, page numbers are used to locate a unique article, indicate its length, give some context, and provide immediate access to a direct quotation. In the digital world, DOIs link the reader to a specific article, but do not provide information on context or length. Article identifiers can provide location and context, but do not help with length. Currently, many publishers who are providing journals one article at a time seem to be combining article identifiers (see Recommendation 8) with pagination that starts with the number “1” for each new article. For some journals, the electronic version first released contains no pagination, then when it is prepared for print, the article is paginated and released again. Yet the reader of the Early Publication article still needs information on the length of the article.

Providing article length as a service to the reader is a key component of scholarship, as is indicating the exact location for a direct quotation. Paragraph numbers may be the answer to the latter. Otherwise, the reader must resort to searching for the quotation.

Examples of Indicators of Length

1. pp. 421–437
2. 136–140
3. 7 pages
4. 3,622 words, 4 graphics
5. 5:33 minutes playing time

7. Article Identifiers

Primary Publishers

If article identifiers are used in a journal, they should be assigned in accord with the following:

- They must contain at least 6 alpha and/or numeric characters so that they cannot be confused with pagination, volume number, or issue number.
- They should contain no punctuation so that they cannot be confused with ISSNs, other similar identifiers, or page ranges.
- They should not be surrounded by parentheses.
- Article identifiers can be simply generated by machine or they can be constructed to have meaning, such as the American Physical Society (APS) original article identifier that indicates issue, section, and sequence within the section.

Secondary Publishers

Abstracting and indexing services should include any article identifiers or other page surrogates assigned by the primary publisher in the abstracting and indexing record.

Background

When journal articles are published one by one, either ahead of the print or in electronic form only, pagination is often eliminated or replaced by a generic 1-n for each article. Traditionally, page numbers have been used in citations and tables of contents to locate a unique article. However, when each article in an issue or a volume or a set of articles starts with 1, pagination in terms of locating the article becomes meaningless. Consequently, publishers have begun to assign article identifiers.

Because there are no standards for article identifiers, there has been a wide variation in their formats. Some publishers, in an attempt to keep the process simple, have assigned 1 to the first article in a set and continued in sequence; however, these one-, two-, or three-digit numbers are easily confused with other elements in a citation. Some publishers have attempted to differentiate using alpha letters or parentheses. These, too, add confusion.

Some might question why a new identifier is needed when a DOI is assigned to the article. The DOI stands alone; its function is to serve as a persistent link to the article. An article identifier, on the other hand, cannot stand alone; its only function is to serve as a proxy for pagination. Consequently, it can be mapped to the table of contents to provide context for the article.

Because article identifiers are an essential element in a citation for a journal that does not feature traditional sequential pagination, it is necessary for the abstracting and indexing services to include them in the record so they can be exported.

Examples

Sequential Numbers

Article identifiers are sequential within an issue or volume. No other meaning is assigned.

Example: Volume 10, May 2008—Sample article identifiers: 053032, 053033, 053034, etc.

System-Generated Non-Sequential Numbers

Some journals assign an article identifier at the time of submission, and the manuscript carries that number through publication. Thus an issue may have articles with very different numbers.

Example: Volume 2008—Sample article identifiers: 857333, 659124, 321937

For Use with Sections in a Table of Contents

This method is used in many journals in Physics.

- First 2 digits signify the issue number.
- Second 2 digits signify the section number.
- Third 2 digits indicate the sequence number for the article within a section.

Example: Volume 12, Issue 10—Article identifier: 100105 for the 10th issue, 1st section, and 5th article.

8. Citation Elements Required and Publisher Display of Recommended Citation

Primary Publishers

Whatever citation system they use, publishers should include a sufficient number of elements so that the combination will describe a unique document.

Required Elements

- Author(s) Surnames, full given names, and middle initials (first initials at a minimum) or institutional author.
- Journal Title
- Article Title
- Publication Date (preferably year, month, and day)
- Volume (if the journal publishes in volumes)
- Issue (if the journal publishes in issues)
- DOI
- Pagination or article identifier (to indicate location)
- Alternative indication of length if pagination is not included

The following would be desirable:

- Author ID when one is standard
- Institutional ID when one is standard for institutional authors

Display of Recommended Citation

Publishers should provide their recommended citation for the article

- On the DOI Landing Page
- In a prominent place as close to the beginning of the actual article in the print version, in the PDF, and the XML.

It is essential that the publisher include all elements required for the recommended citation in the metadata for the article.

Secondary Publishers

Abstracting and indexing services should include all elements necessary to construct a publisher's recommended citation in the abstracting and indexing record. Those services that provide export services should include all recommended elements in the export for any citation system that they support.

Notes

- The author names and initials are used for human understanding. An author ID would be good to have for machine reading.
- It is preferable to list all authors if that is possible. It is understood that in some disciplines the number of authors may be too many to list in one citation, often numbering in the hundreds. In those cases, the journal should decide what number is their maximum and apply their rule consistently to all citations. That number should, however, be more than just two or three authors. Truncating an author list severely is an artifact of print publication, in which publishers were attempting to save pages, and the practice serves the literature poorly.

- If the journal citation system features abbreviated journal titles, the abbreviations should always follow the ISO 4: 1997 Standard, which the ISSN database uses.
- Indication of length is important to the reader in making decisions about what to read. If pagination is not used, the publisher should supply the number of words and number of graphic elements in their metadata.
- It is recognized that different citation systems feature different rules for the order of the elements, the punctuation, even the required elements. This best practice is intended only to assure that all citations include a sufficient number of elements so that each citation will point to only one unique document.

Background

The traditional combination of journal title, volume, issue, page, and year provides a precise, yet brief syntax for identifying an article; this syntax cannot be replaced by journal and article title. In traditional print publications, bound issues with tables of contents helped users locate the unique article even if some elements were incorrect or missing. In the digital world, citations must parse or the reader cannot link to them. Yet, some publishers are providing fewer and fewer citation elements. For example, one online-only publisher abandoned every element except author, article title, and year. The consequence was that the DOIs were not being found and readers could not link to the articles. The article title is a particularly poor guide to identifying a specific article.

Across disciplines, authors frequently provide inaccurate (often wildly inaccurate) citations, to the publications they consulted in their research. Publishers have not had the resources to check references for many years, although there are now new automated tools to help. Inaccurate references do not link; consequently, it is to the author's advantage to provide accurate ones. Providing a recommended citation with each article and educating authors to pick them up may reduce inaccuracies.

Many authors build their reference lists by exporting citations from an abstracting and indexing record into a reference management system or into their own files. Consequently, it is essential that abstracting and indexing services include all necessary elements in the abstract record. These services specify the citation systems for which they provide exports.

Machine readable elements become increasingly important in the digital world. Authors and publishers are increasingly adopting automated processes in their work. The export and reference management systems are one example. Assignment to courseware may be another. Data mining is yet another. Yet a significant infrastructure has been built around the widely adopted, print-based citation models. Completely abandoning these models in an emerging digital environment without constructing an adequate and backward compatible replacement could damage findability. It would be wiser to combine the current citation models with machine readable elements.

Examples of Different Citation Systems

1. AIP Style Manual <http://www.aip.org/pubservs/style/4thed/toc.html>
2. APA Style <http://apastyle.apa.org/>

3. Chicago Manual of Style <http://www.chicagomanualofstyle.org/home.html>
4. CSE Manual <http://www.councilscienceeditors.org/publications/style.cfm>
5. MLA Style <http://www.mla.org/style>
6. NLM “Citing Medicine” <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=citmed>

Examples of Current Citations

From *Human Physiology*

Evans, B.M., Periodic Activity in cerebral Arousal Mechanisms: the relationship to sleep and brain damage, *EEG Clin. Neurophysiol.*, 1992, vol. 83, p. 130.

From *JAMA: Journal of the American Medical Association*

Yusuf S, Vaz M, Pais P. Tackling the challenge of cardiovascular disease burden in developing countries. *Am Heart J.* 2004;148(1):1-4.

From the *Journal of the American Chemical Society*

Li, X.; Wu, H.; Wang, X.-B.; Wang, L.-S. *Phys. Rev. Lett.* **1998**, *81*, 1909-1912

From the *Journal of High Energy Physics*

S.S. Gubser, I.R. Klebanov and A.M. Polyakov, A semi-classical limit of the gauge/string correspondence 2002 *Nucl. Phys. B* **636** 99 [hep-th/0204051]

From *Language Sciences*

Newman, J., 1993a. A Cognitive Grammar approach to Mandarin *gei*. *Journal of Chinese Linguistics* 21 (2), 313–336.

From *Psychological Review*

Arndt, J., Cook, A., Goldenberg, J. L., & Cox, C. R. (2007). Cancer and the threat of death: The cognitive dynamics of death-thought suppression and its impact on behavioral health intentions. *Journal of Personality and Social Psychology*. Vol 92(1), Jan 2007, 12-29. doi:10.1037/0022-3514.92.1.

9. Tables of Contents and Indicators of Completeness

Primary Publishers

Publishers choose to publish articles in many arrangements:

- assigned to traditional issues and volumes
- connected only to a volume
- in an article-by-article sequence connected only to a time period
- or in some other sequence.

Regardless of the format chosen, it is essential that the publisher provide some verifiable listing of articles published within a timeframe or “container” (e.g., issue, volume). In addition, they should clearly label the list and include information on how it was compiled (timeframe or container) so that readers and customers know what they should have received.

The following principles apply:

- Publishers should provide a table of contents for every unit of publication - for issues if the journal publishes issues or for a volume or timespan if no issues are published.
- The table of contents should be labeled so that readers will know if that unit is in progress or completed.
- The completed table of contents, which should include the date the issue or volume was completed, should be published and transmitted to customers via RSS feeds.
- If the publisher finds it necessary to revise a completed table of contents, the revised table of contents should be communicated to readers and abstracting and indexing services.
- Having a machine readable table of contents that includes full article titles on the web and in RSS feeds is desirable.

Secondary Publishers

Abstracting and indexing services do not generally include tables of contents for journals. They should, however, include the publisher designation of the publishing unit (such as issue or volume) in the records for individual articles, and that designation may not be known until the primary publisher releases a completed table of contents.

Background

Completeness is a key issue for libraries, abstracting and indexing services, and the information users these groups serve. In the traditional print journal, elements such as volume, issue, and page number provided an increasing level of granularity that assured the reader that they had available to them all that had been published. Although some publishers have abandoned the concept issues as they moved into publishing article-by-article, it is worthwhile to consider user behavior and needs. Volumes and issues cover content published in a specific time span and they offer manageable chunks of information. Issues give the reader the opportunity to browse the content in digestible slices.

The digital world offers other advantages including speed of publication. However, for the customer or the information user, verifying receipt of all published articles can be difficult. This can be particularly problematic as more and more publishers move to delivering multiple issues in varying stages of completeness. For example, a publisher might have one issue nearly complete, one perhaps half complete, and one with only an article or two available. Another

publisher may simply publish continuously. If primary publishers include completed tables of contents in their RSS feeds, then all interested parties will be able to get them.

Traditionally, tables of contents provide information that is not available elsewhere. Editors often cluster articles in sections, and there may be introductory content to frame the collection. Sometimes there is a guest editor. There is also discussion around papers from a conference. If these elements are not carried into the digital version, rich content is lost.

A table of contents for the unit of publication can play a major role in resolving problems. It should be immediately obvious from looking at the online records for a journal:

- Which issues or sets of articles are still open
- Which sets are closed and what the table of contents is for each issue or set of articles
- Which volumes are closed and what set of articles comprises the volume.

There is a need for consistency in representing titles. Frequently, a journal may feature one article title in the table of contents, a variant (usually longer) at the top of the article, and another in running heads in the PDF formats. This variation causes confusion for the user. Some more magazine-like titles may not be able to accommodate full titles in the table of contents in the print journal; however, care should be taken in truncating them to avoid confusion as much as possible. Further, the title listed on the Web should match the title on the article.

Article-by-article publishing results in a series of articles delivered over a period of time, rather than the point of time associated with a print journal. Both Volume and Issue can be designations of a period of time over which a group of articles was published, with Issue being a subgroup of the time period covered by a Volume. For example, Volume 1 of “Acme Science” could contain the articles published throughout 2008, whereas Issue 1 of that volume could contain the articles published in the first month of 2008.

Providing Volume and Issue gives the user the ability to browse through a period of time in a manageable fashion. While publishers are taking advantage of the speed of delivery electronic publishing enables, it would be helpful if they also retained the concepts of issues, volumes, and tables of contents that also enrich the user experience. Further, for the publisher, the practice enables the identification of productivity within a time range, as well as a manageable way to organize material for presentation and reuse.

Examples of Labels for Tables of Contents

Open Issues or Volumes

- In Progress
- Open
- Articles will be added.

Closed Issues or Volumes

- Closed on (date).
- Completed on (date).

10. Journal Editor Identification

Primary Publishers

Journals should maintain a table of editors on the open web to enable interested parties to track the succession of editors for the journal. That table should include names and tenures for each editor, and it should be linked from the journal.

Secondary Publishers

Journal editorship is not an appropriate article-level statement; consequently, the Working Group saw no role for abstracting and indexing services in identifying editors.

Background

The editor of most journals has a very significant influence on changes in policy and emphasis in the journal, and those can change with the transition to a new editor. Consequently, for any researcher tracing the evolution of a journal or even a field of study, knowledge of the editor as decision maker in a given time period is a key element. In the print journal, the editor is clearly visible with each issue to the reader who looks for them; however, in the electronic version, the editor identification generally disappears.

It does not appear to be practical to place the editor's name on each article. Nor would doing so be entirely accurate, as decisions on individual articles are often made by an associate editor or a team of editors. Further, it is the overall body of offerings that will be significant. What seems to be important is the recording of who was editor in what time period.

11. Copyright Statement

Primary Publishers

Publishers should display the copyright holder and the year of copyright clearly on each article, preferably on the first page. If articles are delivered in multiple formats such as print, PDF, and HTML formats, the copyright holder should be evident in all.

Secondary Publishers

Abstracting and indexing services should include the copyright holder in the record for each article when it is easily determined from the published article.

Background

Traditionally, the journal publisher has owned copyright for the journal as well as for all or most of the articles published in the journal. In the 2008 environment, copyright is much more complex with so many possible permutations that it is likely to be impossible to capture all of them in a best practice. One example is that some journals include acknowledgment of an author's copyright as well as a statement of copyright for the journal compilation for the publisher on some articles.

Even in traditional journals, some articles were not owned by the publisher. For example, works prepared by an officer or employee of the U.S. federal government as part of that person's official duties are not subject to copyright protection in the United States. Therefore, there is no copyright transfer to the publisher, and the work is in the public domain immediately.

Some non-traditional journals in this decade are using the Creative Commons license that is intended to encourage open access and sharing. Under this license, the author retains copyright, but others are permitted to share the article freely and to adapt the work as they choose. The conditions for doing either are that the individual must attribute the article properly, must not use the work for commercial purposes, and must share any transformation of the article in accord with the Creative Commons license.

It is important for the reader to know who owns copyright on individual articles; therefore, both primary and secondary publishers should include identification when it is practicable. In today's environment, however, this is a complex area. One way some publishers handle it is by including a copyright statement at the end of the abstract.

It is important to note that ownership and hence copyright may change over the lifespan of an article. Abstracting and indexing services can provide metadata at the article level only as it was at the time the article was published. A copyright field would be treated in the same way as affiliations and email addresses are. If the rights change, it is not practical to expect the abstracting and indexing service to change the record, just as changing records as author affiliations and email addresses change would not be practical or even appropriate.

Examples of Copyright Notices

- © 2008 XYZ Publishing House
- © 2007 Author; Journal compilation © 2008 XYZ Publishing House
- Copyright 2008 ABC Publishing House

Appendix 1: Glossary

Article Identifier	Article identifiers serve as surrogates for pagination in journals that either do not include pagination at all or number each article 1–n. They are most frequently used in journals that publish article-by-article.
DOI	Digital Object Identifier: A unique identifier for content that offers a persistent link to a piece of scholarly content in the online environment. For scholarly and technical publications, CrossRef is the major Registration Agency of the International DOI Foundation. See www.crossref.org .
HTML	HyperText Markup Language: A language used to describe a text document for placement on the web. HTML uses tags enclosed in angle brackets to establish the desired appearance of the document.
ISSN	International Standard Serial Number: A standardized code used to identify serial publications independent of country of origin, language, frequency, and so on. ISSNs include two groups of 4 digits separated by a hyphen. They are assigned by the ISSN national Centres. See http://www.issn.org . When a single title is published in different media, such as print and electronic, each medium receives a different ISSN.
PDF	Portable Document Format: A file format Adobe Systems created in 1993. PDFs represent documents that independent from software, hardware, and operating systems. The International Standards Organization (ISO) published it as an open standard in July 2008. In practice, the PDF generally replicates the printed page.
RSS Feeds	Really Simple Syndication: a web feed used to provide users with frequently updated content, such as tables of contents for a journal. The publisher syndicates the feed so that users can subscribe to it and receive notification automatically.
URL	Uniform Resource Locator: Essentially an address on the Internet, the URL specifies where an identified resource is located and the protocol for retrieving it.



**Appendix 2: NFAIS Working Group
Best Practices for Journal Article Publishing**

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Appendix 3: Description of the Development Process

In late 2007, the number of publishers releasing articles one-by-one had increased substantially, and many other publishers were considering doing so. Because there were no standards, abstracting and indexing services were encountering a variety of issues that made it difficult for them to index and process the articles. When NFAIS held a members-only meeting on the subject, nearly fifty people attended. The consensus was that a Working Group should be formed to recommend Best Practices that might evolve into industry practice. Between December 2007 and April 2008, the Working Group met 6 times by conference call and in one face-to-face meeting, to consider the problems both primary and secondary publishers face in publishing journal articles in the digital world. There is extreme pressure to get content out into the primary literature quickly and then into the abstracting and indexing services to increase its findability. Doing so has introduced some shortcuts that often make it difficult to identify a unique journal article.

The Mission

“The Mission of the NFAIS Working Group on Article-by-Article Publishing is to develop a draft code of practice and establish guidelines for the use of elements and metadata related to the publication, identification and delivery of electronic scholarly journal literature, with the ultimate objective of facilitating the digital publishing of one article at a time.

The Group shall then work with the NFAIS Board of Directors and other major organizations within the scholarly publishing community to reach agreement upon and implement a final code of practice intended to facilitate the rapid findability and ease of use of scholarly journal articles for all who will benefit from them.”

The Process

The Working Group considered the following basic concepts related to scholarly journals:

- Journal or source of publication
 - Manageable chunks of information and frequency
 - Description of the contents of the chunk of information
 - Individual articles
 - Identification of the creator
 - Time article was created and published
 - Location of a single article within a manageable chunk of information
 - Article retrieval
 - Protection of intellectual property
 - Editors
 - Errata and retractions
-
- Running heads
 - Differences in citation systems

They then essentially deconstructed the journal, considering each of its elements (e.g., volume, issue, page numbers, etc.) and the problems that each was intended to solve in the print environment. They then determined whether an element is still required in the digital world. This labor intensive, but important task gave the members the information and context that they needed to develop a set of recommended Best Practices.

Initially, the elements such as tables of contents, errata, issues, volumes, etc. were perceived as quite old fashioned to some members of the Group. However, when the functions of these elements were considered, the conclusion was that while they may be labeled differently, the reader will still require a list of article titles that were published in a journal during a set period of time. The Working Group considered how many elements would be necessary for a bibliographic citation in order to point to a unique document; in the end, more, rather than fewer elements are needed for electronic journals.

In working through the problems, it became clear to the Working Group that there should be Best Practices for both primary publishers and secondary publishers. In many instances the Best Practices are parallel. It also became clear that it is not possible to isolate article-by-article publishing; rather, the document should apply to Best Practices for all journal article publishing.

The first draft was presented to the NFAIS Board of Directors in July 2008. Following the Board's approval, it was presented to the NFAIS Assembly, which is composed of the official representative from each member organization. In approving the Best Practices, these representatives offered a number of constructive comments that the Working Group has used to shape this final document. The revised version was approved by the NFAIS Assembly on February 13, 2009. We now offer this set of Best Practices to other industry organizations for discussion and possible further refinement. The hope is that the final product will be an industry-wide set of Best Practices related to publishing journal articles in electronic form, particularly those released article-by-article.

Appendix 4: Related Work

Authorship

ICMJE Policy on Authorship and Contributorship

The International Committee of Medical Journal Editors has issued a definition of authorship credit that includes “1) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published. Authors should meet conditions 1, 2, and 3.” The policy encourages journals to develop and adopt a contributorship policy that includes requesting a statement about the contributions of each author. The full policy can be found at www.icmje.org/#author.

Versions

NISO Recommendations on Versions

In April 2008, NISO released the final recommendations on versions of journal articles as articulated by a joint NISO/ALPSP Working Group. They include the following:

- Author’s Original
- Submitted Manuscript Under Review
- Accepted Manuscript
- Proof (any stage between acceptance and formal publication)
- Version of Record
- Corrected Version of Record
- Enhanced Version of Record.

The full statement can be read at <http://www.niso.org/publications/rp/>.

IFLA/IPA Statement on Retraction or Removal of Journal Articles

In April 2006, the International Federation of Library Associations and Institutions and the International Publishers Association issued a joint statement on the subject with 12 clauses that emphasize the importance of the scholarly archive as a “permanent historic record of the transactions of scholarship and outline the process for retraction and removal. The full statement can be read at http://www.ifla.org/VI/4/admin/joint-ifla_ipa-statementJuly2006.htm.

CrossRef’s CrossMark

In Fall 2008, CrossRef is considering a logo publishers could license to indicate their version of record. CrossMark would include both a visible mark designed for human consumption and a metadata format for human and machine consumption. It would be used to distinguish the publisher copy of content from author copies, manuscripts under review or accepted, proofs, or versions that are not controlled by the publisher. The URL for CrossRef is www.crossref.org. As plans become more firm, CrossRef will post information there.
