

NISO RP-15-2013

Recommended Practices for Online Supplemental Journal Article Materials

January 2013

*A Recommended Practice of the
National Information Standards Organization and
the National Federation of Advanced Information Services*

About NISO Recommended Practices

A NISO Recommended Practice is a recommended “best practice” or “guideline” for methods, materials, or practices in order to give guidance to the user. Such documents usually represent a leading edge, exceptional model, or proven industry practice. All elements of Recommended Practices are discretionary and may be used as stated or modified by the user to meet specific needs.

This recommended practice may be revised or withdrawn at any time. For current information on the status of this publication contact the NISO office or visit the NISO website (www.niso.org).

Published by

National Information Standards Organization (NISO)
3166 Clipper Mill Road, Suite 302
Baltimore, MD 21211
www.niso.org

Copyright © 2013 by the National Information Standards Organization

All rights reserved under International and Pan-American Copyright Conventions. For noncommercial purposes only, this publication may be reproduced or transmitted in any form or by any means without prior permission in writing from the publisher, provided it is reproduced accurately, the source of the material is identified, and the NISO copyright status is acknowledged. All inquiries regarding translations into other languages or commercial reproduction or distribution should be addressed to:

NISO, 3166 Clipper Mill Road, Suite 302, Baltimore, MD 21211.

ISBN: 978-1-937522-12-4

Contents

Foreword.....	v
Part A: Business Policies and Practices	1
A.1 Introduction.....	1
A.1.1 Purpose and Scope.....	1
A.1.2 Background.....	1
A.1.3 General Principles.....	2
A.1.4 Comment on Evolving Ecosystem.....	3
A.1.5 Terms and Definitions	3
A.1.5.1 General Definitions	3
A.1.5.2 Definitions for Supplemental Materials	4
A.1.5.3 Comment on Related Content	4
A.2 Roles and Responsibilities Related to Supplemental Materials.....	5
A.2.1 Primary Publishing	5
A.2.2 Related Parties	6
A.3 Recommended Business Practices.....	6
A.3.1 Selecting Supplemental Materials	6
A.3.2 Editing Supplemental Content.....	7
A.3.3 Managing and Hosting Supplemental Materials.....	7
A.3.4 Ensuring Discoverability and Findability.....	8
A.3.4.1 General Consistency.....	8
A.3.4.2 Abstracting and Indexing Coverage.....	8
A.3.5 Referencing Supplemental Materials.....	9
A.3.5.1 Reference within the Article	9
A.3.5.2 Reference in Other Publications.....	9
A.3.5.3 Citations within Supplemental Materials	10
A.3.6 Metadata and Packaging.....	10
A.3.7 Maintaining Links.....	10
A.3.8 Providing Context.....	11
A.3.9 Preserving Supplemental Materials	11
A.3.10 Rights Management.....	12

Part B: Technical Considerations and Implementation Recommendations	13
B.1 Introduction.....	13
B.1.1 Purpose and Scope.....	13
B.1.2 Supporting Documentation.....	13
B.1.3 General Considerations.....	14
B.2 Metadata	15
B.2.1 Background.....	15
B.2.2 Metadata Elements	15
B.3 Persistent Identifiers	20
B.3.1 Background.....	20
B.3.2 Assigning DOIs or other Persistent Identifiers	21
B.4 Preservation	22
B.4.1 Background.....	22
B.4.2 Preservation Recommendations.....	22
B.5 Packaging and Exchange	23
B.6 Location of Supplemental Material Metadata.....	24
B.7 Supporting Documentation	25
Bibliography	26

Foreword

About These Recommended Practices

This project began with an informal survey conducted by Alexander (Sasha) Schwarzman, then of the American Geophysical Union, in October 2009 on how publishers handle supporting materials in scientific journals. The survey results were distributed to the CrossRef and eXtyle mailing lists and generated quite a bit of interest and feedback. In recognition of the importance of this topic the National Information Standards Organization (NISO) and the National Federation of Advanced Information Services (NFAIS) co-sponsored a roundtable discussion in January 2010 to discuss the need for standardized bibliographic and publishing policies for supplemental material. (The previous year the National Federation of Advanced Information Systems (NFAIS) had published a related recommended practice on publishing journal articles.) More than 60 people in attendance participated in a very lively discussion; among the group's recommendations was the formation of a working group to develop recommended practices addressing the business, policy, and technical issues surrounding supplemental materials. The NISO/NFAIS Working Group on Supplemental Journal Materials was formally convened in August 2010, and this document is the result of their work.

In 2012, although the trend toward large numbers of Supplemental Materials being released with journal articles was continuing, no recognized set of practices existed to guide selection, delivery, aids to discovery, or preservation plans. With no commonly accepted guidelines, authors and readers encountered a confusing array of practices, and editors and publishers had no industry basis for decision-making. Related parties such as librarians, publishers of abstracting and indexing services, and repository administrators likewise dealt with disarray in what previously had been a relatively structured scholarly environment. In response to this growing problem, the members of a joint NISO/NFAIS Working Group developed this set of recommended practices. They are intended to help publishers and editors guide authors and peer reviewers in their work and to provide a common ground for delivery of supplemental materials. They are intended to be prospective, not to deal with previously published works.

Some caveats are in order. First, readers will find that the practices are directed mostly to primary publishers, who are the gatekeepers for publishing scholarly journals. However, working group members hope that other related parties will find the document informational. Second, some may find the connotation of Integral Content (see A.1.5, *Definitions*) within Supplemental Materials contradictory; however, this seeming oxymoron reflects the situation in 2012. Publishers have sometimes put essential content that they cannot accommodate within the traditional article into a Supplemental Materials category out of necessity. Although technology will no doubt solve this problem in the future, working group members believed it was important to address the handling of Integral Content as Supplemental Materials as they are treated now. Finally, members have been cognizant of the differing cultures and practices across scholarly publishing and aware of the fact that different fields have different requirements. Consequently, the recommendations include many gray areas.

To work most efficiently and to take advantage of specialized skills and knowledge, the working group formed two subgroups: business and technical, who developed Parts A and B of this Recommended Practice respectively.

Part A begins with terms and definitions and includes the recommendations of the Business Working Group for such business practices as selecting materials, editing them, managing and hosting them, and ensuring discoverability. It also discusses referencing Supplemental Materials, maintaining links, providing good metadata, providing context, and preserving the materials. The roles and responsibilities of various parties as related to Supplemental Materials are outlined and there are recommendations for rights management.

Part B offers recommendations providing metadata for Supplemental Materials, assigning persistent identifiers to them, and ensuring their preservation. It concludes with packaging and exchange considerations. Non-normative supporting documentation to Part B contains an example DTD for Supplemental Materials, a tag library, and examples.

As Part A of these Recommended Practices makes clear, Integral Content and Additional Content are likely to be treated differently throughout the entire lifecycle of a scientific article: peer review, copyediting, markup, citation, and preservation. To enable this differentiation, recommendations in Part B endeavor to make the functional distinction between essential and nonessential elements explicit—regardless of their physical location—by applying unambiguous metadata. Thus, what a reader of a print article could infer from the physical layout, the user of an electronic article, human or machine, will be able to ascertain explicitly through the metadata.

NISO Topic Committee Members

The Content and Collections Topic Committee, which had oversight for this project, had the following members at the time it approved this Recommended Practice:

Julia Blixrud, Co-chair

Association of Research Libraries (ARL)

Betty Landesman, Co-chair

University of Baltimore, Langsdale Library

Eva Bolkovac

Yale University Library

Eric Childress

OCLC Online Computer Library Center

Lettie Conrad

SAGE Publications

Marti Heyman

Cengage Learning

Diane Hillmann

Metadata Management Associates

Rebecca Kennison

Columbia University Libraries

Rice Majors

University of Colorado at Boulder Libraries

Dorothea Salo

University of Wisconsin, Madison

Ken Wells

Innovative Interfaces, Inc.

NFAIS Approval

This Recommended Practice was endorsed by a vote of member organizations of the National Federation of Advanced Information Services (NFAIS™). NFAIS was a co-sponsor of this project.

NISO Supplemental Journal Article Materials Working Group Members

The following individuals served on the Supplemental Journal Article Materials Working Group, which developed and approved this Recommended Practice:

Business Working Group

Linda Beebe, Co-Chair

American Psychological Association (APA)

Annette Flanagan

JAMA and Archives Journals

David Gillikin

National Library of Medicine (NLM)

Bruce Kiesel

Thomson Reuters

Rachael Hu

California Digital Library

Amy Kirchoff

JSTOR/Portico

Marie McVeigh, Co-Chair

Thomson Reuters

Bonnie Lawlor

National Federation of Advanced Information Services (NFAIS)

Alison Loudon

American Institute of Physics (AIP)

Skip Maier

American Psychological Association (APA)

Eefke Smit

International Association of STM Publishers (STM)

Scott Virkler

Elsevier

Technical Working Group

David Martinsen, Co-Chair

American Chemical Society (ACS)

IJsbrand Jan Aalbersberg

Elsevier

Ken Beauchamp

American Society for Clinical Investigation

Jeffrey Beck

National Library of Medicine (NLM)

Chuck Koscher

CrossRef

John Kunze

California Digital Library (CDL)

Kathy Kwan

National Library of Medicine (NLM)

Alexander (Sasha) Schwarzman, Co-Chair

The Optical Society (OSA)

Deborah Lapeyre

Mulberry Technologies, Inc.

John Meyer

JSTOR/Portico

Ira Polans

IEEE

Craig Rodkin

Association of Computing Machinery (ACM)

Kathleen Sheedy

American Psychological Association (APA)

Keith Wollman

Elsevier

Acknowledgements

The Supplemental Journal Article Materials Working Group wishes to acknowledge the following individuals outside the formal working group membership who contributed to this effort.

Doreene Berger

Director, Publishing Operations, American Institute of Physics

John Kiplinger

JSTOR

Chris McMahon

Director, Content Management, American Institute of Physics

Emilie Marcus

Editor-in-Chief, Cell

Marion Muff

Thomson Reuters

Trademarks, Services Marks

Wherever used in this standard, all terms that are trademarks or service marks are and remain the property of their respective owners.

PART A: BUSINESS POLICIES AND PRACTICES

A.1 Introduction

A.1.1 Purpose and Scope

These recommended practices are intended to help the scholarly publishing community develop a more standardized approach to publishing what has become known as Supplemental Materials for Journal Articles in a rapidly changing technology environment. The intent is to lessen the burden on all of the parties engaged in the publishing process, to ensure that Supplemental Materials delivered in connection with journal articles add substance to the scholarship, to make Supplemental Materials more discoverable, and to aid in preserving them.

Existing Supplemental Material may predate electronic publishing. For example, older journals, which have been digitized post-publication, may have had microfiche supplements. In an ideal world, all would be digitized; however, available resources may preclude applying these recommendations to older materials. Consequently, publishers may wish to concentrate their efforts only on future articles.

A.1.2 Background

Over the more than 350 years since scholarly journal publishing began, the basic protocols for writing and publishing journal articles became fairly standard across the many disciplines. In the past two decades, however, technology has enabled an increasing number of options for which there have been limited or no universal standards or best practices.

One such option entails offering authors the opportunity to expand or support their published articles with Supplemental Materials. In 2012, Supplemental Materials often include multimedia—text, tables, and figures that would occupy too much space or would interrupt the flow of the narrative in a traditional print article—as well as data and computer programs. These vary in the level of importance to supporting the article’s conclusions. Some may be absolutely essential, whereas others may be useful, but not critical.

Traditionally, when the printed page was the medium, the functional distinction between essential and nonessential elements was unambiguously reflected in the article’s layout. Essential elements were incorporated into the body of the article, and nonessential items were placed in an appendix. There was an implicit understanding that anything in the appendix was nonessential. Often nonessential items were simply omitted because of page limits.

Electronic media changed the nature of what could be delivered and altered the implicit understandings. Publishers began including dynamic components, such as videos and 3-D materials that could not be printed, and elements that would be impractical to print, such as datasets and computer code, in online Supplemental Materials. As authors work with these new materials, their mix includes both items essential to the understanding of the work and nonessential ones. However, the clear intellectual distinction between the two is not neatly reflected physically. In 2012, it is not unusual to find both essential and nonessential content in the same files placed under the rubric Supplemental Materials.

From publisher to publisher and from journal to journal, Supplemental Materials can vary in both content and treatment. For many journals, more supplemental content has been added over time—to the extent that it can be difficult for readers to understand what the information actually supplements. Further, content that is a critical part of the evidence for the article’s conclusions can be lost to future readers if it

is indiscriminately grouped with other less crucial materials surrounding the article. Thus, it is important for authors and editors to think carefully about Supplemental Materials.

This document was written in the context of the potential options available in 2012, but technology, readers' needs, and information overload are speeding the evolution of the journal article. The group believes that in the future articles are likely to be presented and used in modules, rather than in the linear fashion generally used in 2012. The various modules, which will likely include content that is considered supplemental today, collectively may be considered the article. As Emilie Marcus, *Cell*'s Editor-in-Chief, wrote when *Cell* changed its approach to supplemental Materials starting in 2010: "...over time, the concept of Supplemental Materials will gradually give way to a more modern concept of a hierarchical or layered presentation in which a reader can define which level of detail best fits their interests and needs."¹ The article is likely to be distributed, that is, not delivered in one linear document. This distributed model may apply to both location and who has curatorial responsibility for the various modules.

A.1.3 General Principles

In coming to agreement on recommended practices, the Working Group articulated a number of broad principles related to publishing and the technical environment.

- 1) Respectful of the wide variance in issues across disciplines and types of content, the recommendations are intended to be guides, not edicts.
- 2) Published articles constitute the scholarly record; therefore, practices must reflect the information future researchers will need to understand and build on articles published today.
- 3) Online Supplemental Materials are intended to provide useful and relevant content. Editors and their publishers should ensure that all Supplemental Materials are tightly pertinent to the article they accompany and should strive to avoid publishing redundant or extraneous content.
- 4) The determination of which materials should be considered supplemental to an article should be the responsibility of the Journal.²
- 5) Readers of any single article and its Supplemental Materials may vary substantially in what portions of an article they consider necessary for their personal comprehension and use. Therefore, packaging the materials and providing clear signals about what it contains is a key concept.
- 6) These recommendations are intended to reflect best practice and to look to the future rather than being limited by paradigms from the past.
- 7) Technology continues to change rapidly; consequently, this set of recommended practices should be considered a living document that will need regular review and updates.
- 8) These recommended practices are primarily intended to address content owned, published, and hosted by the journal publisher (or the journal's contracted publisher or online platform host), although there are some references to content hosted by external repositories.
- 9) Business models are beyond the purview of these practices.

¹ Marcus, E. "Taming Supplemental Material." *Cell*, 2 October 2009, 139(1): 11. doi:10.1016/j.cell.2009.09.021. <http://www.cell.com/retrieve/pii/S0092867409011817>

² Journal, when capitalized, is used throughout this document to substitute for the specific decision maker, who might be the editor or the publisher depending on the organization.

- 10) Publishers should make their best efforts to provide the same level of accessibility to Supplemental Materials, in compliance with national laws governing access for persons with disabilities, as they do for their journal articles.
- 11) The focus of this set of recommendations is on Supplemental Materials at the article level, not at the issue or journal level.
- 12) Data constitute a unique emerging category of content. The scope of these recommendations does not extend to the management of data in general; instead, they address the inclusion of data when they are published as Supplemental Materials.

A.1.4 Comment on Evolving Ecosystem

The world of scholarly publishing is changing rapidly along many dimensions. What is published outside the article as Supplemental Materials today may well be incorporated into a new type of article tomorrow. One example is how data are treated. Over the past decade, more funding bodies and more journal publishers have set forth an expectation that the data underlying a research report be made publicly accessible. In 2012, journals and scholarly articles devoted to data are emerging. Consequently, data, which have up to now been placed outside the article, may be incorporated into some articles. Presenting datasets with an article requires that authors take the time to provide clear metadata and explanations of how the data were used in their study, such as special coding instructions. Another example is multimedia, which until recently, was of necessity placed in Supplemental Materials. It is possible that evolving technology will enable better integration of these materials into the article.

A.1.5 Terms and Definitions

The following terms, as used in this Recommended Practice, have the meanings indicated.

A.1.5.1 General Definitions

article	An original publication that appears in a scholarly journal. An article is a complete, coherent work that provides all materials necessary for a reader to comprehend the scholarly work described.
data	Attributes of a variable or set of variables that may be qualitative or quantitative; may represent facts, figures, or ideas; and may be expressed in numbers, words, or images. Generally, data represent information gathered for analysis or decision making. Raw data are attributes that have not been processed and analyzed.
metadata	Additional information or context about other data. For example, machine readable metadata headers tell what elements the document contains, when it was created, when it was changed, who created it, size of the file, title, author, type of content, and so on. (See Part B for more on metadata.)
multimedia	Multiple forms of media (or content) that may include any of the following: text, images, audio, and/or video, with or without interactivity between the user and the content. Previously used to distinguish print from other media, it is increasingly seen as a combination of multiple forms. Technology is now enabling the incorporation into the article of multimedia content that earlier was consigned to Supplemental Materials.