NISO Strategic Directions

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Contents

Introduction

NISO Mission Statement

NISO fosters the development and maintenance of standards that facilitate the creation, persistent management, and effective interchange of information so that it can be trusted for use in research and learning.

In 2007, NISO moved to support a new strategic direction to be able to create and support standards to be more effective in a quickly-changing information landscape. As part of this strategy, it undertook a new governance structure and implemented the *NISO Framework*, an overarching model and roadmap for NISO's standards work. Because the landscape in which NISO operates continues to undergo rapid change, the NISO Board, in its strategic directions document first published in 2005 and last updated in 2011, included a mission statement that calls for NISO "to develop standards that enhance the effectiveness of the value chain that supports the creation, persistent management, and effective interchange of information so that it can be trusted for research and learning." In order to fulfill this mission, NISO needs to maintain a comprehensive and comprehensible view of that value chain. The Framework was developed partly as a tool to help NISO classify its standards and other work and thus realize where gaps exist and no organized work is taking place, potentially helping to determine areas of need where NISO could contribute, or identify the areas or community segments where opportunities exist to collaborate with other entities/standards bodies.

As part of this 2007 Framework, NISO organized several Topic Committees and an Architecture Committee to lead, shape and manage the NISO standards portfolio. The three Topic Committees oversee working groups, review new work items, undertake research projects, and solicit feedback from the community on standards or best practice work that should involve NISO. The Architecture Committee coordinates the work of the Topic Committees and provides more strategic guidance on the standards portfolio to the NISO Board of Directors.

In 2017, the NISO Board of Directors and NISO staff adopted the following NISO Core Value Statement:

> **Engagement:** NISO enables libraries, publishers, and vendors to collaborate and solve problems of mutual interest by providing a neutral forum in which they can engage and build consensus.
>
> **Interoperability:** NISO supports choice and efficiency across our community by promoting interoperability of information products and services through standards and best practices.

Education: NISO keeps our community up to date by publishing news, running educational programs, and providing thought leadership.

NISO continues to operate in a complex space with many interrelated components. It remains important to continue to verify that our work effectively serves our stakeholders. Every few years, the NISO Topic Committees undertake a comprehensive review of their current and recent portfolios and discuss their overall scopes of work. This review of potential future activities serves several purposes: an effort to validate or update the Framework; a chance to consider more closely any particular industry trends that may affect NISO planning; and an opportunity for individual Topic Committee members to understand the work of the other Topic Committees and to potentially offer ideas and other contributions that will enrich the overall future directions for NISO work. This exercise was also intended to identify any cohesive themes that run through the work of each Topic Committee to appropriately and adequately address them in the course of development of each Topic Committee's respective portfolio of standards and recommended practices, and to support any need for Topic Committees to effectively collaborate.

In 2016-2017, as part of the review, the Architecture Committee and Topic Committees included stakeholder input in the form of a public survey which requested information about the relative values of individual NISO publications: standards, recommended practices, technical reports, primers, and white papers. This data led to a major effort of further analysis and restructuring of the Topic Committees to better ensure that they are able to appropriately address gaps in the information-standardization landscape and to include related works in the same Topic Committee portfolio. During Summer 2017, each Topic Committee adopted a new name. Although the respective project portfolios mostly remained intact, due to updated scoping, a few projects moved to a different Topic Committee for oversight. Members of the Topic Committees and the NISO Board of Directors feel that the new names communicate more clearly the areas of work and directions for each group:

2007-2017 ("old" name)	From 2017 forward
Business Information Topic Committee	*Information Policy & Analysis Topic Committee*
Content & Collections Management Topic Committee	*Information Creation & Curation Topic Committee*
Discovery to Delivery Topic Committee	*Information Discovery & Interchange Topic Committee*

An ongoing concern of Topic Committees is overlap in work areas: one NISO project, depending on its scope and stakeholders, could potentially span two or more Topic Committee portfolios. For example, standards and recommendations for semantic Web activities may be managed by

either or both of the Information Creation & Curation and the Information Discovery & Interchange Topic Committees, depending on the specific thrust of the area in question, whether it is related to development and support of vocabulary activities (ICC) or linked data "in action" (IDI). The Architecture Committee exists, in part, to help address some of these overlapping areas. The existence of an overlap in domain or expertise should not be seen as a barrier to advancing work.

It should also be apparent to the NISO community that NISO does not work in isolation. Additional industry efforts such as those managed at Crossref, BISG, EDItEUR, and COUNTER (as only a few examples) are of great interest to the members of the Topic Committees, who seek to remain up-to-date on this work that may relate to NISO projects or planning.

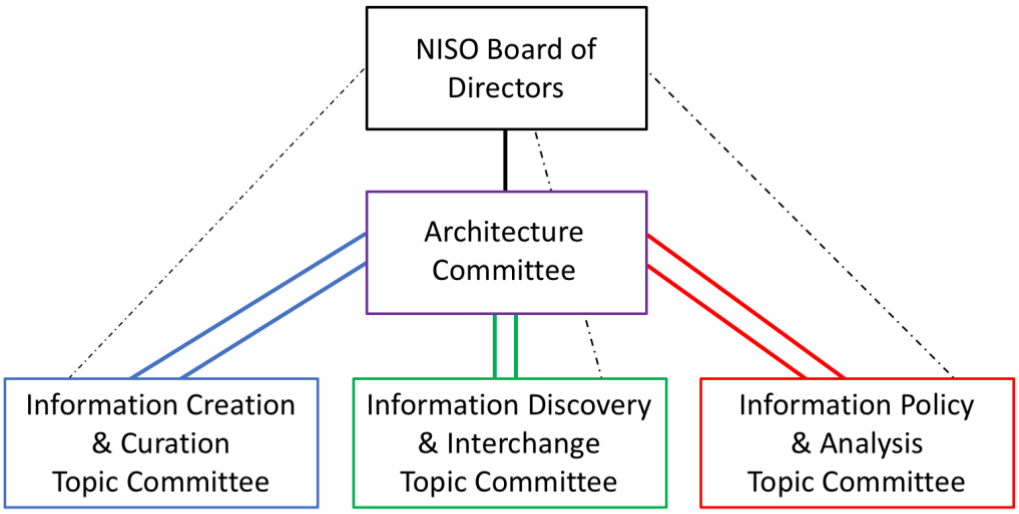
This document is the summary of this work by the three Topic Committees. Current and past activities of each of the Topic Committees can be viewed at the archive for *Working Group Connection*, a quarterly update distributed via e-mail to the members of the *NISO Newsline* mailing list.

Architecture Committee

The Architecture Committee is the NISO leadership group which connects the NISO Board of Directors with Topic Committees that are responsible for the organization's output. It consists of the NISO Board Vice-Chair who serves as its chair, the two co-chairs of each Topic Committee, and NISO's Executive Director and Associate Director for Programs who serve as ex officio members. In 2017, NISO Board members volunteered to liaise with each Topic Committee, and these liaisons also participate in Architecture Committee discussions as observers to ensure that there is awareness of priorities from the Board, as well as needs and expectations from the grassroots level in standards development.

The Architecture Committee's main function is to coordinate Topic Committee activities and direct their strategies through sharing of information and discussion of issues and industry directions. Additionally, it advises the Board of Directors on strategic questions vis-a-vis NISO's standards development program. Current and upcoming Topic Committee projects are discussed at the Architecture Committee level, and where areas of work may overlap across two or more Topic Committees, the Architecture Committee is responsible for determining an appropriate process for managing the overlap. This process may vary depending on the nature of the work and its stakeholders and timelines, but could be as simple as ensuring appropriate liaisons from the appropriate Topic Committees participate in the project's discussions.

The Architecture Committee provides a structure for the co-chairs of the Topic Committees to share the activities and discussions in their areas of work and remain aware of topics that could potentially be discussed in more than one Topic Committee, receive ideas from each other, and cooperate on projects in ways that benefit all.



1. The Vice Chair of the NISO Board of Directors serves as the Chair of the Architecture Committee (solid black line)
2. Co-chairs of each Topic Committee serve as members of the Architecture Committee.(solid colored lines)
3. Three Board members each serve as liaisons to the Topic Committees and attend Architecture Committee meetings as observers. (dotted black lines)

Figure 1: Architecture Committee and Topic Committee Structure

Information Creation and Curation (ICC) Topic Committee

Scope

The Information Creation and Curation Topic Committee focuses on issues regarding metadata creation and management, cataloging and description, vocabulary and ontology management, publishing schemas and specifications, preservation and data curation, and repositories.

Trends and Emerging Themes

The most significant current trends within the information community relevant to ICC are the increased variety in types of content, the findability of materials due to the massive increase in digital content, the increased level of granularity in information assets for purchase and access, the move toward a linked data bibliographic framework, and the difficult challenges of digital curation and preservation. Specifically:

- The types of both open access content and fee-based content in the ecosystem continue to expand and diversify, making description of and providing easy access to these materials more complex. For example, datasets have a wide variety of forms and functions, and citations are at times required down to the row level, which increases the challenge for content management and description.
- Semantic web-based access and support are increasingly in demand, requiring wider support for interoperability of vocabularies and ontologies and increasing the need for disambiguation services for newly minted or assigned entities. Challenges here include developing best practices for development and support of new vocabularies and ontologies, as well as for addressing challenges encountered in duplication and insufficient information to serve in disambiguation. As the amount of content in repositories and on the Web grows, the ability to locate specific information or documents will become increasingly dependent upon the support for linked data and machine reasoning.
- Digital repositories span an increasingly wide variety of content, from institutional repositories, preprint servers, data repositories and web archived content to learning objects and digitized primary source materials. Continuing challenges include providing adequate description and context for this variety of content to support retrieval which can also be shared effectively in the wider environment, assigning reliable retrieval mechanisms such as unique identifiers while interlinking related content at appropriate levels, and clustering related information while disambiguating similar identities.
- Digital curation and digital preservation are pressing issues, as tremendous quantities of valuable digital content disappear daily from the Web, or become inaccessible due to software and hardware changes, media obsolescence, bit loss, failed storage devices, or inadequate management. Content creators are largely unaware of the impact their choice of software, formats, description, and storage can have on continued access to their creations over time. Archivists and librarians are overwhelmed by how to even appraise and select from the tremendous quantities and varieties of digital content available, and then how to ingest and manage the content effectively and efficiently for long-term access. As funding challenges reduce the staffing available to manage digital curation and digital preservation, the need for best practices, guidelines, and standards to provide guidance becomes critical.
- Traditionally published content, such as e-journals and e-books published both by formal publishers and independently, still remain key cornerstones of the academic community and the

content requires accessibility at the collection, title, item, and element levels and preservation. In addition, we are seeing more and more highly interlinked products produced by publishers and by academics, which have significant preservation challenges related to the content itself (everything about the "item" is not contained in the item; valuable information is in the "network") and to the nature of the producer (small projects that produce fantastic resources and then lose funding).

- Increasingly, content creators are seeking to produce content that can be reformatted, repackaged, mixed with other forms, in whole or in part, for different channels. Standards for content creation can support these single-stream content creation approaches and product developments. These existing standards related to file standards creation and development require ongoing maintenance of existing standards to meet changing needs of content creators, but extensions of these specifications to include a greater range of content forms is valuable. Consistent application of these structures is also vital to reuse of content, and working with the implementer communities to foster consistent use should be a priority.

Information Discovery and Interchange (IDI) Topic Committee

Scope

The Information Discovery and Interchange Topic Committee focuses on issues regarding the finding and exchange of data to optimize discovery and use of information and material. Specific topics include discovery systems, transfer of data, user experience, web services, etc.

Trends and Emerging Themes and general areas of work

Overarching themes, some emerging from the completed work in the IDI Topic Committee's portfolio, a white paper that was commissioned by IDI's predecessor, the D2D topic committee and written by Marshall Breeding in 2015, and internal discussions within the topic committee, are:

Discovery of open access and free resources

The increase in open access content opens up issues and questions, such as:

- Metadata quality and sharing, especially in and from institutional repositories, noting there is an overlap with the Information Creation & Curation Topic Committee
- Expectation of users for one-stop access to content (which can cause unintended "pirate" sites that short-circuit access policies)
- Consistent use of open access indicators on item level in the metadata (e.g., NISO *Access License and Indicators* Recommended Practice) and via API (e.g., oaDOI)
- Consistent definitions of and indicators for differing versions, for example: pre-print and pre- or post-peer review versions
- The discovery, vetting, and access of/to open educational resources

Transparency in discovery

Discovery indexes and search engines index a vast amount of material. Transparency of what is discoverable is not always a simple task for the different stakeholders, not least because of the large amount and variety of material. IDI will continue to look for ways to increase openness and transparency for libraries and end users, while respecting the business needs of content providers and other vendors. The Open Discovery Initiative Standing Committee is an example of that initiative.

Discovery of non-traditional content-forms

The focus of many market players is shifting from mainstream material such as articles and books to non-traditional material such as research data, interactive (and other) educational material, and digital and audiovisual material. Issues that may be addressed by IDI in future emerge around:

- Discovery and interoperability of research data, including:
  - Force11 FAIR (Findable, Accessible, Interoperable and Reusable) data principles
  - Connecting research data with related publications
- Finding and using teaching and learning material, including:
  - OER (open educational resources) including Open Textbooks
  - Adaptive learning material and systems that adjust to the learner's mastery of the course material
  - "Flipped classroom"-related material
- Discovery and use of digital and audiovisual material

Data quality, publishing and exchange

Data quality and linking users to the appropriate full text remain at the heart of discovery. IDI will continue to identify areas where data and metadata quality can be increased, and data exchange improved, to better meet the needs of users. Examples from ongoing projects include KBART, KBART Automation and the Open Discovery Initiative. This area is closely related to transparency in discovery as it allows librarians and end users to more easily see what information is contained in the tools they use.

Data exchange has several areas of note to IDI. IDI will continue to support data exchange between the different NISO stakeholders, recognizing the need for an increased pace of custom transactions to manage information resources and satisfy ever-increasing user expectations. Additionally, IDI supports schema.org efforts in general to publish data as linked data, therefore allowing easy indexing of content by search engines such as Google. These wider industry efforts are outside the direct purview of NISO, but IDI may address questions and needs arising from their applications in the world of library discovery and scholarly publishing.

The role of identifiers and identifier quality remains an important one. The use of identifiers to represent traditional library content (DOI, ISBN, ISSN, and so forth) is well established. There is also a marked increase in the use of identifiers for other forms of content – identifiers for data sets, musical works, and texts – as well as identifiers representing organizations, individuals, grants, and other entities that are part of the information production, distribution and preservation chain. IDI will monitor these various types of identifiers as they continue to proliferate.

Systems interoperability, authentication and APIs

Data quality, publishing and exchange touches on some aspects of system interoperability. IDI acknowledges, however, that there may be need to address questions beyond the exchange of data between content providers, libraries, discovery systems, search engines, and knowledge bases. This specifically refers to:

- APIs to support innovative developments and implementations across the industry, based on systems and data repositories owned and managed by different industry stakeholders
- Single sign on and authentication across systems to allow users to access all resources they are entitled to without the need for multiple logins, as well as carrying over preferences and other personalized aspects that can be used for discovery

There will always be tension between the creation of new features and functionality and the establishment of standards that support systems interoperability. IDI supports that innovation, while recognizing that systems interoperability is also desirable. IDI will endeavor to play a role in determining when new innovations are ready for cross-system standardization and recommended practices, via traditional methods or emerging web services/APIs, as well as encouraging ongoing innovation.

Many communities -- particularly those in the library and information field -- are also leveraging lighter-weight generic web technologies to achieve more sustainable system interoperability. The practice of using HTTP REpresentational State Transfer (REST) to exchange JSON-encoded resources, for instance, is a well-established trend for browser-to-server and server-to-server communications. IDI supports this trend to lower the barrier of interoperability with systems outside of NISO's traditional information management chain.

Enhancing the user experience

While the above-listed themes revolve around sharing and linking data, this theme is about the possibility of making use of standards and recommended practices for building features that enhance the user experience when discovering content. Specific discussion points in this area may include practical needs around and engagement with:

- The use of linked data and the full realization of the semantic web to connect data points and provide users with extended information at the point of need
- Creating context around material; for example, by connecting it to citations, to reviews, to information about the author, etc.
- Personalization: using behavior patterns of a person or a group and other analytics to dynamically affect relevance and recommendation, and its problematic relationship with privacy
- The use of visualization of data and material connections in discovery
- Discovery and use of annotations on information resources, including papers and datasets

In addition, the IDI Topic Committee recognizes that many user communities use--as their primary discovery tools--search engines and other resources that are not managed by libraries or vendors. It is important to keep this “direction” in mind when planning any future strategy that touches on any of the above areas.

Information Policy & Analysis (IPA) Topic Committee

Scope

The Information Policy & Analysis Topic Committee focuses on issues regarding the management structure surrounding the acquisition, licensing, purchasing, and analysis of information. Specific areas include: privacy, license expression, online usage data, access management, collections and research analysis and assessments, performance measures, and other statistics.

Trends and Emerging Themes

Overarching themes emerging from the completed work in the Information Policy & Analysis Topic Committee's portfolio and anticipated trends:

- An assortment of emerging metadata issues has substantial implications for business systems. Metadata that eventually supports discovery, use, and content management will need to interoperate with or be generated initially to support business operations.
- New business models continue to develop as digital publications and value-added services evolve.
- A new subset of business models is developing around open access publications or portions of publications.
- New levels of granularity within publications, including handling of supplemental materials for articles, are creating new challenges for managing business processes.
- Publications increasingly re-enter business cycles at multiple points in their life cycles as print publications are digitized or sub-sections are monetized.

Significant trends anticipated by the Information Policy & Analysis Topic Committee include:

- Rapidly developing identifier systems for authors, funders, institutions, publishers, and content (articles, repositories, databases, and datasets) are likely to have implications across NISO Topic Committees. Within the Information Policy & Analysis Topic Committee's scope of work, a variety of business systems will need to appropriately leverage identifiers relating to publications, creators, publishers, institutions, funders, etc.
- Information to support business systems must integrate seamlessly with metadata for resource discovery and content management, regardless of the carrier of the bibliographic metadata. The library and publisher communities can't have duplicative systems where information is discarded, rekeyed, re-entered etc. by each user. Further exploration of needs in this area may involve collaboration with the NISO Information Creation and Curation Topic Committee.
    - Use of mass-market vendors to obtain materials for library collections is very much on the uptick. Libraries are doing a huge amount of business with Amazon and other closed vendor systems. Integration of usage data from these systems is often lacking.
    - Increasingly, legacy content is a significant source of purchases. Again, connecting information from business processes with information that allows linking/overlaying with existing discovery metadata is important.

- Value-added services require ways to link the added value to the existing resource.

- Greater support for metadata creation is needed for materials produced outside North America, Western Europe and Australia. Metadata creation early in the purchase cycle can facilitate many business processes, but particularly for non-Roman scripts or works coming from low- and lower-middle-income countries, such metadata for publication identification is rarely provided prior to receipt of the purchased or licensed material.

- Knowledge bases are increasingly operating at the intersection between business systems and discovery systems. Ongoing maintenance of quality metadata in knowledge bases is critical to their effectiveness. Some recent analysis of knowledge base performance suggests that journal transfers between publishers tend to be represented poorly in knowledge bases.

- Changes in the granularity of publications require new support from standards and best practices.

  - Smaller publishers want chapter level metadata for books, which requires structuring chapter-level abstracts and, perhaps, structures to carry work-level metadata to chapters, as well as navigational support and reference handling.

  - Altmetrics, a variety of new, alternative usage and quality metrics, are rapidly evolving with a focus at the sub-publication level, e.g., at the article level. In the past year, NISO has undertaken further exploration of potential standards work in this area and the Information Policy & Analysis Committee will evaluate and approve any proposed projects.

- Increasing deployment and adoption of open publishing and research sharing systems is creating a need to support new business models and business systems to support activities such as author-side payments, hybrid journals with both open and toll access articles, open access monographs, etc. This support is related to a trend that business systems underpinning open access payments may need to interoperate with systems supporting access and usage, and, further, is connected to the trend of identifier systems noted above.

  - Uptick in author-side payments for open access will require business systems that integrate identifier infrastructures for authors, funders, publishers, etc.

  - Hybrid publications may leverage different business models for parts of publications, e.g., open access articles in subscription journals, , requiring different support mechanisms than a fully open access journal.

  - Open access monographs may have different associated business models than open access journals.

  - Issues arise regarding usage metrics beyond Project COUNTER, including how publishers and libraries get statistics for open access monographs, journals, articles, and research data in a dispersed access environment.

  - Licensing terms for open access works (including monographs) are undefined. Additionally, there may be separate content licensing issues related to institutional repository projects.

- Data –whether or not open—needs to be connected to relevant publications or more granularly within a publication, e.g., to journals, tables, figures, and images.
- New systems and services are developing to handle article publication charge payments on behalf of authors. These systems need to interoperate with both publisher and institutional systems. Automation and standardization are needed to create and manage a working infrastructure for publishers, institutions, and funders regarding page charges.

Next Steps

The individual Topic Committees found, in general, that the delineation between areas that was made in 2007 is for the most part still valid. The Architecture Committee is a useful forum for keeping track of what activities are being pursued by each Topic Committee and for brainstorming strategies for managing some inevitable overlap in a constantly changing landscape.

The Architecture Committee and Topic Committees are using the ideas and trends listed in this document to formulate action plans for potential work in the coming year and shape monthly Topic Committee discussions; this work will likely involve conducting outreach activity to identify stakeholders, impacts, and relevancy to the NISO community.

NISO is very interested in any and all feedback from the community on these and other potential initiatives. Please send any comments to us via our website or via email at nisohq@niso.org.