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Revising the ISSN: involving stakeholders to adapt a bibliographic standard to its ever-changing environment

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Abstract:

The International Standard Serial Number is one of the oldest identifiers in the bibliographic domain, and also one of the most widely used and known. It was first established as an ISO standard in 1975, as ISO 3297. Originally intended for printed serials, the ISSN standard has been able over time to evolve in order to meet the needs of its users. It has known four revisions since its first release, the latest being in 2007. ISSN are now applicable to serials and to other continuing resources, whether past, present or to be published or produced in the foreseeable future, whatever the medium of publication or production.

Each ISO standard regularly undergoes systematic revisions. In April 2016, a vote on the opportunity of a systematic revision was issued by TC46/SC9 to all ISO member bodies. From April to September 2016, they will vote to support or not a complete review of the ISSN standard. Evolution of publishing models, forms and formats; emergence of new concepts and description standards in the library and publishing domains; apparition of new identifiers; and the development of linked data are the most important factors that justify why a revision of the ISSN standard should happen.

Keywords: ISSN, standard, serials, continuing resources.

1 INTRODUCTION TO THE ISSN SYSTEM

The International Standard Serial Number is one of the oldest identifiers in the bibliographic domain, and also one of the most widely used and known. It was first established as an ISO standard in 1975, as ISO 3297. The ISSN is an eight-digit number: the first seven digits are assigned sequentially and the eighth acts as a control number. It is a purely “dumb” identifier in the sense that it does not convey any semantics – unlike, for example, the ISBN in which a sequence of digits identifies a country, then another sequence identifies a specific publisher, etc. This totally opaque approach has been adopted because the resources identified by ISSNs have a “life” and their features may change over time: for instance, the identity of the publisher or the country of publication.

The semantics of the ISSN are not in the number itself, but they are provided in the ISSN record: indeed, each resource to which an ISSN has been assigned is also described in a unique record, which has to be updated to follow the evolutions of the resource itself. The second identifier of the resource is its key-title, which is also unique¹. Finally, each different medium edition (e.g. printed, DVD, online...) of the same resource gets a different ISSN: therefore, using FRBR terminology, one may consider that the ISSN identifies a manifestation.

An ISSN may be assigned to any kind of continuing resources, which are defined as “a publication, in any medium, that is issued over time with no predetermined conclusion and made available to the public”². There are two main types of continuing resources:

- Serials, or “continuing resource issued in a succession of discrete issues or parts, usually bearing numbering”³. Periodicals (such as journals, newspapers or magazines) are not the only types of serials: this category also includes monographic series and blogs.
- Ongoing integrating resources, defined as follows: “A continuing resource that is added to or changed by means of updates that do not remain discrete and are integrated into the whole”⁴. This category is not very broad for printed documents, as only loose-leaf publications belong to it, but it is dramatically extensive in the digital world as it includes databases... and all websites – except for blogs.

The original goal of the ISSN system was to identify all continuing resources, whatever their content. There were as a matter of fact some exceptions: ephemeral continuing resources or continuing resources of purely local interest were generally excluded from ISSN identification. But the general objective of a comprehensive identification remained valid. From that point of view, the ISSN numbering system shared similar goals with Universal Bibliographic Control.

However, the huge increase of digital (especially online) publications has made unachievable – and thus irrelevant – this objective of comprehensive identification, at least for certain types of publications. Further criteria have been set up to select what kind of web sites, databases and blogs should get an ISSN: the scope has been restricted to scholarly publications, or more broadly to resources proposing an editorial content. A precise description of the millions of blogs and websites was indeed out of reach.

This distinction is actually not stated in the ISSN Standard itself, but the Standard refers to the ISSN Manual for “more detailed operational guidance” on ISSN scope⁵. This Manual is a set of detailed rules for the bibliographic description of continuing resources, which is maintained by the ISSN Review Group, a group of experts from ISSN national centres (see below).

In spite of this limitation, the ISSN has faced the challenge of the description of digital publications. On December 2015, out of the 1.9 million records of the ISSN Register (which comprises all resources described since 1975), 180,000 describe digital resources. If we take the figures for 2015, 23,450 ISSN were assigned to digital publications out of a total of

¹ The key-title is similar to the title proper of the resource when it is unique in the Register. Otherwise, the key-title is composed by the title proper and qualifiers. See *ISSN Manual*, January 2015, section 2: http://www.issn.org/wp-content/uploads/2013/09/ISSNManual_ENG2015_23-01-2015.pdf.

² See *ISO 3297:2007. Information and documentation -- International standard serial number (ISSN)*, September 2007, 2.1., p. 1: http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=39601.

³ *Ibid.*, section 2.2., p. 1.

⁴ *Ibid.*, section 2.3., p. 2.

⁵ *Ibid.*, section 1, p. 1.

73,880 – i.e. more than 30 %. This figure includes recently published serials or websites, but also the digital versions of retrospectively digitized resources. As a matter of fact, ISSN may also retrospectively identify past resources which are no longer published.

ISSN assignment and bibliographic description are performed in a decentralized fashion, by ISSN national centres –one per country. There are currently 89 national centres, which are generally hosted in national libraries, academic libraries or book chambers. These national centres – or, in ISO terms, *registration agencies* – send on a regular basis the records they produce to a central directory, the ISSN Register. This Register is itself managed by the ISSN International Centre (ISSN IC or CIEPS⁶) – the *registration authority* in ISO terms. The coordination of the ISSN Network and the maintenance of the Registry encompass, for the ISSN IC, several responsibilities:

- political and organizational coordination ;
- bibliographic coordination and support: ISSN IC is the publisher of the ISSN Manual; it provides advice to national centres, and its staff is involved in standardisation bodies at ISO and IFLA;
- validation and ingest of records sent by national centres;
- assignment of ISSN and bibliographic description of publications from countries without national centres or those published by international organizations;
- provision of access to the Register through the ISSN portal (upon payment) or through ROAD, the Directory of Open Access scholarly Resources (freely accessible, but restricted to records of open access publications)⁷.

This approach of decentralized assignment at a national level / centralized maintenance of a Register is a specificity of the ISSN system, compared with other standard identifiers. It has been designed as early as the ISSN standard itself. The ISSN system is therefore supported by a strong network: including dozens of professionals worldwide.

Reliable identification is indeed a critical requirement for the management of process of production, advertising, selling, distribution and access to continuing resources. To understand the use of ISSN numbers, it is interesting to analyse who is requesting them. In most cases, ISSN requests are sent by publishers when their resource is first released - it is also often possible to have an ISSN assigned before the new resource is even formally published (prepublication assignments). A unique number helps publishers with the management of their own supply chain: it eases relationships with distributors, stores, subscription agencies, libraries... Publishers of printed resources often use ISSN as part of their barcodes, through an agreement with GS1, the organization responsible for the management of the assignment of barcodes. Besides, ISSN for digital publications are necessary for a better promotion and discoverability on the major scholarly platforms. For example, the ISSN number is requested by most indexing or abstracting services, as well as the DOAJ (Directory of Open Access Journals⁸) or CrossRef (the organization in charge of assignment DOIs for scholarly publications⁹).

When the national centre is hosted by a National Library, assignment may also be performed as part of the legal deposit process. Finally, ISSN may be requested by third parties: other libraries, digitization agencies... Reliable identification has proved useful for

⁶ CIEPS stand for “Centre International d’Enregistrement des Publications en Série”, or International Centre for Registration of Serials.

⁷ <http://road.issn.org/>.

⁸ <https://doaj.org/>.

⁹ <http://www.crossref.org/>.

the management of resources in the framework of digitization processes and for the distribution of content in digital libraries. It may finally be a requirement when library consortia move their physical collections to a shared space.

2 THE ISSN STANDARD NOW: A NECESSARY EVOLUTION

Created more than forty years ago, originally intended for printed serials, the ISSN standard has been able over time to evolve in order to meet the needs of its users. It has known four revisions since its first release. The latest revision, published in 2007, brought two main improvements.

- The scope of the standard was clarified. In 2002, the library community had revised the ISBD(S), for “Serials”, in order to include websites and databases – hence calling it ISBD(CR), for continuing resources¹⁰. It became then necessary to specify if these kinds of digital publications were also eligible for ISSN assignment – and if it was feasible to systematically identify and describe them. As stated above, the solution was a compromise: ongoing integrating resources were declared eligible but the ISSN Manual proposed additional inclusion and exclusion criteria.
- The linking ISSN, or ISSN-L, was designed. The ISSN-L is an additional identifier which groups together editions on different media of a same title: e.g. the printed and online editions. The ISSN-L, automatically calculated by the ISSN Register, is in fact the ISSN of the first registered publication of the same set of resources. Therefore, it is not a “new” ISSN.

The ISSN-L is designed to uniquely identify a title, whatever its medium, while the ISSN identifies a title on a specific medium. The ISSN-L has also been a compromise: indeed, some members of the ISO working group were willing to assign the same ISSN to a title as such, whatever the number of medium editions, while others wished to set up different levels of ISSN identification: for the manifestation, the work, the family of titles, etc.

However, since 2007, the context of digital publishing has critically evolved. New types of publication have emerged. There is no need to recall the growing importance of open access publishing, either on the golden road (publication in OA journals) or on the green road (self-archiving of articles in open repositories) – and these two kinds of resources, online journals and repositories, may be assigned an ISSN.

Besides, new forms of digital scholarship have gained a stronger legitimacy, notably the publication through blogs or even social networks. These forms of communication are under the focus of “altmetrics”, a broad class of statistics which attempt to capture research impact through non-traditional means¹¹. As a matter of fact, the audience of publications on the social web is often more important than the one of “traditional” information sources. Finally, new formats have emerged: EPUB was still in its infancy in 2007, while the 3.0

¹⁰ See *ISBD(CR): International Standard Bibliographic Description for Serials and Other Continuing Resources*, 2002, introduction, p. III-IV: http://www.ifla.org/files/assets/cataloguing/isbd/isbd-cr_2002.pdf.

¹¹ On altmetrics, see for example Cameron Barnes, “The Use of Altmetrics as a Tool for Measuring Research Impact”, *Australian Academic & Research Libraries*, vol. 46, Iss. 2, 2015: <http://www.tandfonline.com/doi/full/10.1080/00048623.2014.1003174>.

version is now widely used – not only for e-books but also for periodicals¹². Serials are now often read on mobile devices, thanks to specific formats.

Not only has the object of description itself evolved, but also the way it is described. Since 1998 and the publication of the final report on the Functional Requirements for Bibliographic Records (FRBR)¹³, we have changed our monolithic view on the published resource: we now see it as a set of hierarchically organized entities. FRBR had already an influence on the 2007 revision of the standard, as the ISSN-L was notably designed to allow for the collocation of different manifestations (identified by different ISSN) of a same serial work (identified by its ISSN-L). However, since 2007, we have seen the publication of FRAD (Functional requirements for authority data, 2009¹⁴) and FRSAD (Functional requirements for authority data, 2010¹⁵). FRBR, FRAD and FRSAD are soon to be superseded by their consolidated version, FRBR-LRM (Library Reference Model, still an IFLA draft¹⁶). FRBR-LRM itself has been influenced by the publication, in January 2010, of the object-oriented (i.e. linked-data friendly) version of FRBR: FRBR_{OO}¹⁷. Finally, the library world is considering the use of RDA (Resource: Description and Access), an initiative intended to take into account the FRBR model in the actual cataloguing rules. It has been adopted or will be adopted by numerous institutions internationally, including host institutions of ISSN national centres.

The publishing world has also greatly improved its set of descriptive metadata. The necessity to easily exchange information between its stakeholders was not new. But with online commerce, they were urged by the need to display, on a standard form and on every platform, the information pertaining to the printed and digital resources they were selling. In that domain, the reference organisation is EDItEUR, an international group coordinating the development of the standards infrastructure for electronic commerce in the book, e-book and serials sectors. EDItEUR has developed a series of metadata standards bearing the common name ONIX (ONline Information eXchange).

These different evolutions – description models and rules, from publishing and library worlds – have influenced each other. For example, RDA and ONIX experts have worked closely on a common definition of content, media and carrier types¹⁸. Cross fertilization is also obvious in concepts and terminologies: “Works” or “Manifestations” are terms used in ONIX standards¹⁹. This lays the ground for enhanced cooperation between professional communities.

¹² The Open EBook Publication Structure (OEBPS), ancestor of EPUB, was approved in 1999. However, the name EPUB itself appeared in October 2007 when the OEBPS 2.0 was renamed EPUB 2.0. See <http://www.idpf.org/epub/30/spec/epub30-changes.html#sec-diff-intro-history>.

¹³ *Functional Requirements for Bibliographic Records. Final report*, revised in 2009: http://www.ifla.org/files/assets/cataloguing/frbr/frbr_2008.pdf.

¹⁴ See *Functional Requirements for Authority Data. A Conceptual Model*, revised in July 2013: http://www.ifla.org/files/assets/cataloguing/frad/frad_2013.pdf.

¹⁵ See *Functional Requirements for Subject Authority Data (FRSAD). A Conceptual Model*, June 2010: <http://www.ifla.org/files/assets/classification-and-indexing/functional-requirements-for-subject-authority-data/frsad-final-report.pdf>.

¹⁶ See *FRBR-Library Reference Model. Draft for World-Wide Review*, February 2016: http://www.ifla.org/files/assets/cataloguing/frbr-lrm/frbr-lrm_20160225.pdf.

¹⁷ See *FRBR object-oriented definition and mapping from FRBRER, FRAD and FRSAD (version 2.2)*, March 2015: http://www.ifla.org/files/assets/cataloguing/frbr/frbroo_v2.2.pdf.

¹⁸ See <http://www.rdaregistry.info/rgAbout/rof.html>.

¹⁹ See ONIX 3.0 Specifications. Product Information Format Specification, release 3.0, revision 3, April 2016: <http://www.editeur.org/93/Release-3.0-Downloads/>.

ISO standardisation groups are one of these places where publishers, librarians and other information experts can group together, exchange ideas and find shared solutions to common issues. Standards related to information and documentation are under the responsibility of the Technical Committee 46. The ISSN itself is revised under the auspices of the Sub-Committee 9, dedicated to identification and description. The recent activity of TC46/SC9 in that domain has been impressive: since 2007, five new identifiers have been officially created:

- International Standard Text Code (ISTC, or ISO 21047:2009), for the identification of “works” – in FRBR terms;
- Digital Object Identifier system (or ISO 26324:2012), i.e. the standardisation of the already existing DOI system;
- International Standard Name Identifier (ISNI, or ISO 27729:2012), identifying “public entities of parties”, i.e. physical or moral persons;
- International Standard Collection Identifier (ISCI, or ISO 27730:2012), for collections;
- International Standard Link Identifier (ISLI, or ISO 17316:2015), dedicated to links between entities.

This list does not take into account all identification standards that were revised during that timeframe, notably the ISBN, the oldest standard of the domain, whose revision is currently under final vote.

One of the reasons explaining the dramatic increase of the number of identifiers in the information and documentation domain, is the emergence and the affirmation of the linked data, or web of data. It relies indeed on the use of URIs: persistent, standard and unique identifiers, associated to a namespace, are the most reliable way to identify resources. The principles of linked data were already existing in 2007, but were quite new – Tim Berners-Lee’s famous paper of on “linked data design issues” dates from 2006²⁰. Since then, numerous projects involving linked data principles and techniques have been launched, often at the initiative of libraries.

3 POTENTIAL FIELDS OF DISCUSSION

Evolution of publishing models, forms and formats; emergence of new concepts and description standards in the library and publishing domains; apparition of new identifiers; and the development of linked data are the most important factors that justify why a revision of the ISSN standard should happen. Previous discussions with publishers and other stakeholders of the serials supply chain, with representatives of ISSN national centres, or with other users of ISSN numbers, have helped the ISSN International Centre to identify different domains, or set of issues, where the ISSN standard may be modified.

3.1 Scope of the ISSN standard

A first series of discussion could be held about the definition of the scope of the ISSN. On one hand, the 2007 revision clarified that “ISSN are applicable to serials and to other continuing resources, whether past, present or to be published or produced in the foreseeable future, whatever the medium of publication or production”²¹.

²⁰ Tim Berners-Lee, “Linked Data”, *W3 consortium website*, 2006: <https://www.w3.org/DesignIssues/LinkedData.html>.

²¹ ISO 3297:2007, *op. cit.*, section 1, p. 1.

But on the other hand, some notions remain subject to interpretation. The standard states that “when a continuing resource is published in different media, with the same title or not, different ISSN and key titles shall be assigned to the different editions”²². However, the definitions of “different media” or “different edition” for digital publications are not well detailed. In 2007, those in charge of the revision of the standard acted with caution, considering that the digital publishing world was still evolving too fast to set up a definition of “edition” that would remain relevant in the following years. Therefore, the standard refers to the ISSN Manual for more details. This in turns states that “A single ISSN is assigned to identify all online versions made available under the same title including: versions digitized from print, born digital versions, versions available simultaneously in different encoding formats such as PDF or HTML, and versions for mobile phones, e-readers, etc.”²³. However, an additional note warns that “this rule, provisionally adopted at the end of 2011 (...) may change in the future”²⁴.

This question of scope was an important subject of discussion for the last revision of the ISBN standard. The draft international standard (still unpublished) as of November 2015 states that: “When a publication is available in the same product form but with differing product form details (e.g., it is available both as a jacketed hardback and an unjacketed hardback, an online PDF and an online EPUB), then these are unique products that shall be identified by unique ISBNs”²⁵. Therefore, separate ISBNs are not assigned to separate editions²⁶, but to each different publishing format. Should the scope of ISSN be harmonized with the one of the ISBN to identify more precisely each format, as they provide different user experiences, or should a broad definition of “medium” be kept? Is the current distinction print/online/digital on media still sufficient?

3.2 Granularity of ISSN assignment

The second series of issues that could be discussed for the ISSN revision is also related to the definition of the entity that should be identified by an ISSN. However, the question is not “how many ISSN should be assigned?”, but “at which level?” It deals therefore with the question of the granularity of ISSN assignment.

As explained above, an ISSN is currently assigned to a unique title on a specific medium, while an ISSN-L is assigned to a unique title whatever the medium may be. However, larger entities, encompassing several resources, could also be identified. When a continuing resource undergoes a major change in title, the key-title established by the ISSN Network and the ISSN number also changes²⁷. There are therefore families of titles, grouping the different titles of the same resource over time. Several stakeholders, notably in the library domain, are advocating for the creation of family-level ISSNs, so-called “meta-ISSN”, to identify these broader entities.

However, this would raise the questions of the boundaries of these families. How should we deal with mergers, when two titles evolve into a single one, or on the contrary,

²² *Ibid.*, section 4.5, p. 3.

²³ ISSN Manual, *op. cit.*, section 2.2.3.

²⁴ *Ibid.*

²⁵ ISO/DIS 2108, *Information and documentation – International Standard Book Number (ISBN)*, still unpublished, section A.1.8, p. 8.

²⁶ Edition in ISO/DIS 2108 is defined as “all manifestations of a publication embodying essentially the same content”; a note states that “a single edition of a publication may be published in multiple product forms”. See *ibid.*, section 3.5, p. 2.

²⁷ Note that the ISSN standard distinguishes between major changes, which lead to a new ISSN, and minor changes which are only recorded as variant titles. These rules are stated in details in the ISSN Manual.

with splits? The extent of the families becomes even broader if we include the local editions of periodicals, or the editions in other languages.

On the other hand, ISSNs could be used to identify resources at a finer level of granularity: i.e. issues, or even articles. The question would not be to create new identifiers, but to figure out how the ISSN number could be used to identify these resources. To that end, it should be possible to build on the experience of two standards or practices issued by NISO. The SICI (Serial Item and Contribution Identifier, ANSI/NISO Z39.561-1996, Version 2²⁸), was a first attempt to identify in a standard way sub-parts of a serial. Due to lack of implementation, it has been officially withdrawn. However, the PESC (Protocol for Exchanging Serial Content, NISO RP-23-2015²⁹), recently released, also provides recommendations in the same area.

3.3 Interaction with other descriptive standards and other identifiers

As a matter of fact, a thorough analysis of the documents published or revised in the recent years is necessary to ensure that the ISSN itself is still up-to-date and consistent with other standards. One should specifically care about the consistency with other standard identifiers, notably the new ones. The same resource may *bear* several identifiers: an article may be identified by its DOI and by the ISSN number of the serial in which it is published; a serial with an ISSN may be under the responsibility of an issuing body identified by an ISNI. Finally, what would be the difference between a “meta-ISSN” identifying a title, and an ISTC identifying a “work” in FRBR terms? Therefore, it should be ensured, on one hand, that there is no overlap between the scope of different standards, and on the other hand, that no kind of resource remains in a “dead angle” and that all of them can be identified by a standard number.

However, as already stated, standards may originate from other bodies than ISO. Harmonization with ONIX standards would notably be a field of interest. Information from publishers is mandatory to establish the ISSN record: therefore, it would be beneficial to align the list of metadata that they should provide to national centres³⁰, and the list of mandatory and optional metadata in ONIX. The ISSN IC is already a member of ICEDIS, the working group dedicated to the development of ONIX standards for serials³¹. Ensuring the coherence between different sets of instructions should allow for more efficient and more automated assignment and cataloguing processes.

4 CURRENT STATUS AND FUTURE STEPS

Each ISO standard regularly undergoes systematic revisions. In 2011, when the question of a systematic revision of the 2007 edition was put forward, it was decided to maintain the 2007 edition without modification. The topics of discussion for a revision were indeed not mature enough.

However, a minor revision was voted in April 2016, through a TC46/SC9 ballot. It was resolved to remove from the standard any mention of the business model of ISSN, at the request of the ISO Central Secretariat. This decision was taken so as to comply with new ISO

²⁸ See http://www.niso.org/apps/group_public/project/details.php?project_id=75. NISO, or National Information Standards Organization, play for the USA the role of ISO member body, dealing with standards dedicated to information and documentation.

²⁹ See *Protocol for Exchanging Serial Content (PESC)*, approved in May 2015: http://www.niso.org/apps/group_public/download.php/15266/RP-23-2015_PESC.pdf.

³⁰ This list is provided in Annex B of the current ISSN standard.

³¹ See <http://www.editeur.org/59/icedis/>.

rules which instruct to remove from standards any information about organizational aspects of identifiers assignment.

In April 2016, a vote on the opportunity of a systematic revision was also issued by TC46/SC9 to all ISO member bodies. From April to September 2016, they will vote to support or not a complete review of the ISSN standard.

In case of a positive ballot, i.e. if the systematic revision is actually approved, the topics mentioned above, among others, will be discussed by a dedicated working group. Its members will be experts nominated by ISO TC46/SC9 member countries³². It is expected that this working group will associate professionals from various countries. The participants should also hopefully represent all stakeholders of the serials supply chain: from publishing industry to IT system vendors, from libraries to subscription agencies. The ISSN IC will strive to organize a large consultation on the objectives, the scope, and the technical specifications of the ISSN, in order to ensure that this forty-year-old standard will evolve in the appropriate direction to better serve its users, now and in future years.

³² See the list of ISO TC36/SC9 member countries: http://www.iso.org/iso/fr/home/standards_development/list_of_iso_technical_committees/iso_technical_committee_participation.htm?commid=48836.