The International Standard Book Number: A Success Story

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Abstract

With the development of computers and automated technology for cataloging published works in the mid 20th century, the need arose for a numerical identifier of unique works which could be standardized across international borders, media, and allow ease of use throughout the industry. Through collaborative efforts between book sellers, librarians and publishers, the International Organization for Standardization (ISO) developed the International Standard Book Number (ISBN) which has gained widespread global use for the past forty-five years. This paper considers the historical development of the ISBN format including key figures in its creation and the structure of assigned numbers. Throughout its history, only a single major structural change has occurred: the expansion of the ISBN from ten digits to thirteen. The more recent preponderance of electronic works has created certain difficulties with the ISBN system and has led to additional identifiers, which will be differentiated from the ISBN. Chief among the current limitations of the system is the question of how to link the ever-growing amount of metadata associated with published electronic works, each of which requires a separate ISBN. Several current and future potential answers to this question are presented. Finally, while it may be argued that the greatest impact of the ISBN usage has been in the publishing and sales industry, the development of this unique identifier has also had a tremendous impact on cataloging and school libraries.

Keywords: international standard book number, publication identification, identifiers

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Throughout the printed works industry, publishers, retailers, catalogers, librarians and consumers need to be able to identify printed and electronic resources unambiguously. Using titles may lead to confusion due to similarities or even identical words, while tracking works by author can encounter similar difficulties due to misspellings. Half a decade ago, a few specialists in the industry saw the need for a clear, unique identifier which could be used in conjunction with automated systems as computers became more prevalent (Ehlers, 2000, p. 25-26). The development of the International Standard Book Number (ISBN) system answered this need and enabled publishers, retailers, librarians, and consumers to track and find the published works they required. With the introduction of computerized systems used for inventory, sales tracking, circulation statistics, ordering and distribution, this single identifier is now indispensable to the entire industry (Walravens, 2010, p. 18).

History and Development

In the 1960s, with technology growing and the wide-spread use of computers on the horizon, several booksellers and publishers in Europe and the United States began to see the need for a standard number which could be used to automate their production, inventory, and sales. In the United Kingdom in 1965, WH Smith, a book retailer, was preparing to move into a new warehouse and would be utilizing computers to track their merchandise so the company hired several consultants to devise a system of numbering to achieve this end (see Appendix A). One of those consultants, Professor Gordon Foster, a newly hired statistician at Trinity College, Dublin, developed the Standard Book Number (SBN) system and algorithm and wrote a report which was sent to the Publishers Association in 1967 (Charkin, 2015). The next important players were the Whitaker family, who owned and published the influential weekly magazine on

publishing in the U.K., *The Bookseller*. David Whitaker jumped on board with the idea that his organization would catalog all the SBNs from the various publishers. Whitaker then wrote the first rule book for the British SBN in 1967 and the system went into use (Charkin, 2015).

Meanwhile, Hans Jürgen Ehlers, a German specialist in publishing and bookselling, presented a paper to the Third International Conference on Book Market Research, held in Berlin in 1966, about the development of the Standard Company Number (SAN) in Germany (Ehlers, 2000, p. 26). Across the Atlantic, Don Melcher, the president and owner of the R.R. Bowker Company (who published *Library Journal* and *Publishers Weekly*), was equally driven to develop a numbering system for the publishing world and wrote a paper titled "Book Numbering: The Need for National and International Standards" (Ehlers, 2000, p. 26). Both papers made it in 1967 to Johanna Eggert, a German, who had recently been appointed the Secretary of the International Organization of Standardization (ISO) Technical Committee 46 (TC/46) (Ehlers, 2000, p. 26). Started in 1947, the ISO developed as communities throughout Europe recognized the need for international standards created by knowledgeable specialists in each field. While the standards are voluntary, the global community has much to gain by using such standards, thus the ISO has continued to grow into a tremendous organization whose standards affect many areas of daily life around the globe. Today, the ISO develops standards that cover safety, healthcare, construction, engineering, banking, securities, design, transportation, energy management, and community development to name a few. Ehlers (2000) wrote that in 1967, ISO TC/46 was created to "address itself to 'numbering systems in documentation.' Thus came together a group of renowned international specialists in system design with a common goal: to prepare the book and library world for the use of computers" (p. 25). The committee's working group included Eggert, as secretary, Ehlers, Melcher, Whitaker,

and Suzanne Honoré, a librarian and cataloging specialist from the Bibliothèque Nationale in Paris. Representing the fields of standardization, bookselling, publishing, and library cataloging, these individuals worked together to evaluate and ultimately expand the British SBN system to international capabilities and developed the ten-digit International Standard Book Number (ISBN). The ISO approved it as Standard 2108 in 1970, and the ISBN system launched into the international publishing world.

The success of the system depended on meticulous records and attention to the rules for establishing and assigning numbers. In April 1971, Eggert offered the International ISBN Agency (IIA) a home and staff in the German State Library (Ehlers, 2000). The agency developed a three-tiered structure involving publishers, national/regional agencies, and the IIA. The ten-digit ISBN format rapidly became the standard for many parts of the world and allowed for more efficient tracking of published works, sales, and the use of computerized technology in the field.

Though the format of the ISBN allowed for many possible numbers, the options are still finite; so with the rapid acceleration of published works including electronic formats, the ISO and IIA began to anticipate exhausting all possible combinations. In 2001, a working group began to evaluate possibilities to allow for more numbers while incorporating the existing 10-digit numbers. Two additional questions were addressed to this group: how to incorporate the growing metadata associated with electronic publications and how to increase compatibility with the International/European Article Number (EAN) barcoding system to allow published works to utilize the same point-of-sale barcode system as other retail items (Vitiello, 2004, p. 3). The 13-digit format was the result of this process and, as of January 1, 2007, all new ISBNs issued are 13 digits (Grabois, 2003, p. 15).

Structure and Form of the ISBN

The original ten-digit format (developed from Professor Foster's nine-digit SBN system) included three elements and a check-digit. The thirteen-digit format adds a three-digit prefix element, for a total of five components, as seen in Figure 1 below. (It is important to note that the middle three elements can vary in length, so it is not usually possible to look at an ISBN and tell much more about the work than perhaps the language of the country of origin.) The IIA Users' Manual (2012) provides a detailed description of the five elements and structure of the ISBNs which contain prefix 978. The next prefix to be used will be 979, but the rules for assigning numbers are likely to change. (p. 28)

Prefix Element

The first element consists of three digits issued by GS1 (the EAN agency.) Currently, only 978 is available for use until the supply of ten-digit ISBNs has been exhausted. Previously issued ten-digit numbers may be converted to thirteen digits using calculators which are available online, but the check digit algorithm is different (thus the last digit will change), so there is more to the conversion than simply adding on the new prefix. Both prefixes, 978 and 979, identify books as belonging to "Bookland" and thus separate book barcodes from other retail items (typically assigned a geographic barcode) in this way (Walravens, 2010, p. 16).

Registration Group Element

The second piece, the registration group element, is issued by the International ISBN Agency. This element can vary from one to five digits and is based on either language or region of the registration group. For example, a zero or one means it is from an English-speaking country (Walravens, 2010, p. 15). The Caribbean community uses 976 as its registration group element, regardless of language (Brathwaite, 2011, p. 17).

Registrant Element

The one to seven digits of the third element are assigned by the official ISBN agency in each country by taking into consideration the size of the publishing company, anticipating the number of ISBNs needed, and making a determination for how many numbers to issue.

Publication Element

Once the publisher receives the block of ISBNs, they are responsible for making the individual assignments within the block of numbers they receive. According to the IIA (2012), "different product forms of a publication (e.g., hardback, paperback, Braille, audiobook, online electronic publication) require separate ISBNs. Where electronic publications are made available in different file formats each *separately available* format shall be assigned a unique ISBN." (p. 10). Since it is important for a customer to receive the correct file type for compatibility with his or her device, a publisher or retailer must be able to distinguish between the ISBNs of the various file types to provide the correct file. Of particular import to librarians is this: if a library makes available a digital version of a book as a new product, through scanning or digitizing, the book should receive a new ISBN (IIA, 2012, p. 14).

Check Digit

Finally, the last number is a check digit. This number results from a calculation done with all of the preceding digits and functions to detect errors in the number. If an error is made during entry, the check digit would not be correct and the system programmed with the algorithm would alert the user to the error. It wouldn't indicate which digits were wrong, but it does work most of the time to catch human entry error. While the 10-digit system allowed for the Roman numeral ten (X) in the check digit place, the 13-digit system requires a single digit between 0 and 9.

As shown in the figures below, the ISBN is recorded in EAN format below the barcode, and must also be recorded in "human readable form" above the barcode. (IIA, 2012, p. 17) Human readable form should include either spaces or dashes to separate the five elements of the ISBN, as seen in Figure 2, and facilitate reading, though those spaces or dashes do not have any value significance (IIA, 2012, p. 8).

Figure 1: ISBN Barcode with Labels. (n.d.). ISBN Image Credit: Sakurambo at English Wikipedia

Figure 2: ISBN Barcode. (n.d.).

Figures 1 and 2 retrieved from English Wikipedia https://en.wikipedia.org/wiki/International_Standard_Book_Number

Limitations

With the number of electronic formats continually growing and changing, the industry's system may need to adapt to better link the metadata to each format. The Book Industry Study Group's Identification Committee issued a policy statement entitled "Best Practices for Identifying Digital Products" to address the growing practice of publishers not issuing separate ISBNs to each electronic format, largely due to the sheer volume of the task. Phil Madans, chair of the Best Practices Identification Committee, described the chaos of digital formats as "a

constantly changing landscape, and trying to establish standards and policy was, and is, like trying to build a house in the middle of a hurricane" (Madans, 2012, p. 11). Nevertheless, the principals which developed as foundational for those best practices returned to the ISBN as the "anchor" between the "chain of metadata" and the content, regardless of the format (Madans, 2012, p. 14).

Finally, one more drawback is that the ISBN, at its core, is just a number. While there are several partial databases, "there is no International ISBN Database" (Mazov & Gureev, 2014, p. 207). Without a connection to a database, having an ISBN does not grant the user any information about the material. Additionally, ISBN numbers "are less preferred for use during citation, since they focus attention on the type of a publication rather than its content" (Mazov & Gureev, 2014, p. 210).

One possible solution which could address several of these issues is the use of a two-dimensional bar code, such as a QR code as seen in Image 3, to contain the identifiers, metadata, authenticity coding, and security. A number of libraries are already using QR codes to enhance patrons' experiences of locating books and even connect patrons with the library's website and social media accounts (Xu, 2014 p. 347). It does not have human readability and would require a scanner, however, with the prevalence of cell phones and reader apps as in Figure 3, even in rural third world countries, access to the necessary technology should be possible.

Figure 3: QR Code and Scanner. (n.d.). Retrieved from https://pixabay.com/en/qr-code-scanner-bar-code-156717/

ISBN and the school library

Grabois lists six uses libraries have for ISBNs: “Ordering, copy-cataloging, lending statistics, national lending right, interlending, and union catalogs” (2003, p. 19). As the primary identifier used by publishers and retailers, the ISBN maintains critical importance for libraries as they expand their collections. As demonstrated earlier, the ISBN also functions as the most efficient identifier to connect patrons with the format of materials they desire. If a patron requests an item by ISBN expecting the hardcover copy, but receives the audiobook on cassette tape because separate ISBN numbers were not assigned, the library is not serving well the needs of the patron. Similarly, if a patron requests a specific format of an e-book for a reading device, but receives an incompatible format because the same ISBN was assigned to all of the electronic publications of a work, again, the needs are not well-served. As Weissberg states, “consumers need to know which digital versions of titles are available, and whether one version or another is compatible with their needs or with their software or hardware devices, and understand what

their usage rights will be" (2008, p. 256). Without unique identifiers for the various forms of a work, libraries will have a very difficult time matching up their available materials to the needs of their patrons.

Of particular importance in the school library, since the budget takes into consideration circulation statistics, librarians use the ISBN to track how often a work is borrowed. These statistics help the school librarian maintain a collection that is up-to-date and meet the continuing needs of the students and faculty. The ability to scan barcodes with the ISBN dramatically improves the functionality of the library, both through time savings for the staff as well as through integrating seamlessly with computer systems for borrowing and tracking materials.

Conclusions

For forty-seven years, the ISBN has had tremendous success as an identifier, and has become a critical part of publishing, marketing, distributing, lending, and purchasing written materials. Librarians should have an understanding of how the ISBN system facilitates and expedites collection management, circulation statistics, and patron satisfaction, as well as how the ISBN functions for publishers and catalogers. Although it is not a universal requirement for published works and the continual development of electronic publishing will likely provide momentum for additional adjustments in the future, the fact that ISBN is still going strong as the primary identifier is a testament to its success as a standard and the forward thinking of its creators.

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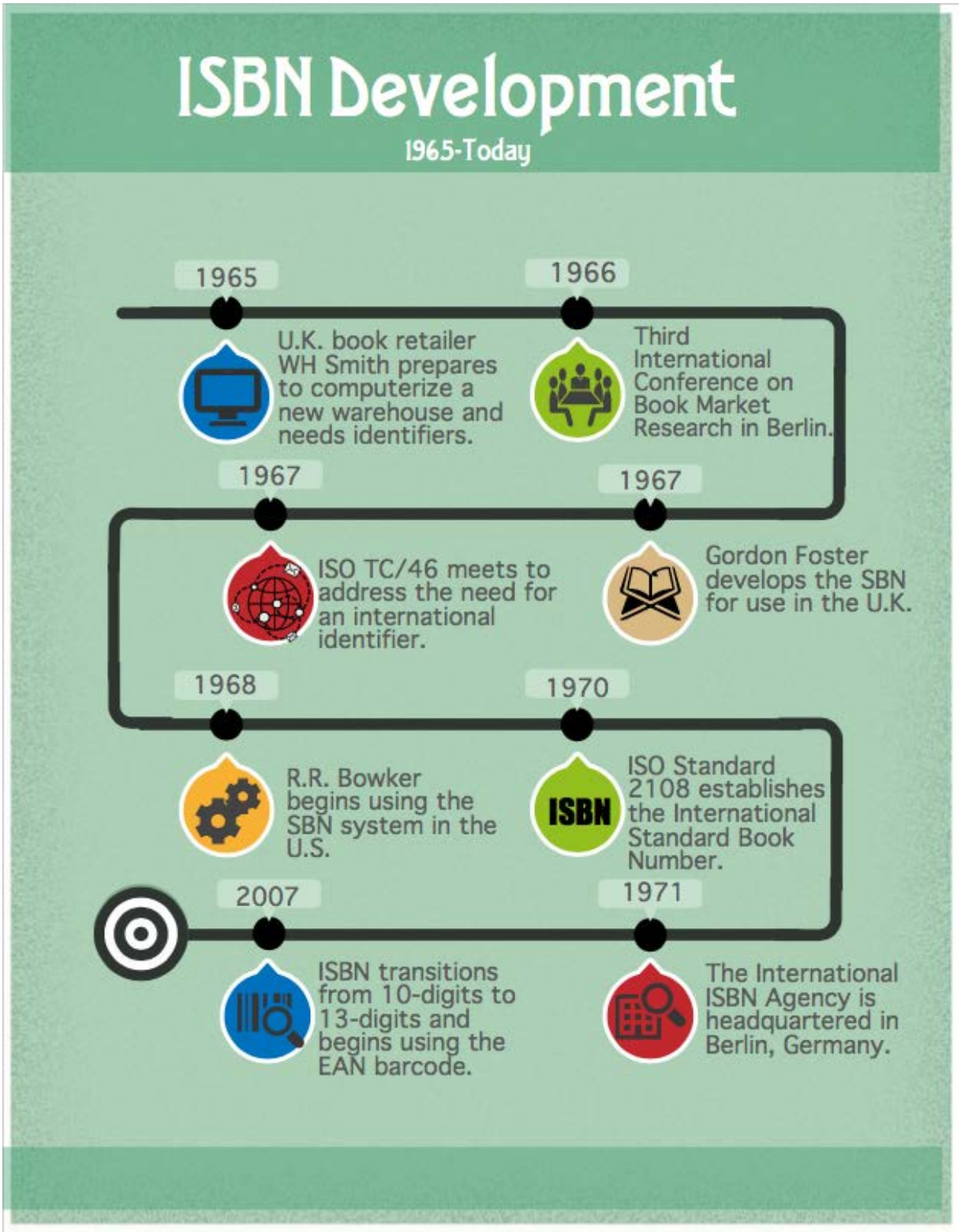
Appendix A


ISBN Development
1965-Today
1965
U.K. book retailer WH Smith prepares to computerize a new warehouse and needs identifiers.
1966
Third International Conference on Book Market Research in Berlin.
1967
ISO TC/46 meets to address the need for an international identifier.
1967
Gordon Foster develops the SBN for use in the U.K.
1968
R.R. Bowker begins using the SBN system in the U.S.
1970
ISBN
ISO Standard 2108 establishes the International Standard Book Number.
2007
ISBN transitions from 10-digits to 13-digits and begins using the EAN barcode.
1971
The International ISBN Agency is headquartered in Berlin, Germany.

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