

The Power of Identifiers in a Connected World

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Identifiers rule!

I have a confession to make. I'm a bit of an identifier nerd. Let's be clear – I am not a maths genius and I prefer the written word to a set of sums any day. However, identifiers hold a special place in my heart. I have a deep appreciation for them, particularly those used in the publishing world, strings of seemingly nonsensical numbers or numbers and letters. A librarian by trade I have spent the last 20 years or so working at the Publications Office of the EU (OP). For background, OP is the publishing service of the European Union institutions, agencies and other bodies. As such, it is the 'central point of access to EU law, and also to publications, data, research results, procurement notices and other official information[1]'.

The Publications Office therefore plays a central role in informing the public about what the EU does and means for them and plays the role of a 'publisher' for EU content. My work at OP has meant that I have been closely involved with identifiers for more than 20 years as they play a key role in connecting EU content and delivering user services.

To give you an example of the hold identifiers have on me: a few years ago, I had the opportunity to attend PIDapalooza, a conference on identifiers. The organisers (the Californian Digital Library, Crossref, DataCite, NISO & ORCID) had taken inspiration for its name from Lollapalooza, a Californian summer music festival. The name PIDapalooza was meant to recall (particularly for North Americans) the thrill of a pop festival but with the headliners being persistent identifiers (PIDs) instead of rock stars. I was thrilled to have an opportunity to attend the first conference, that incidentally just happened to be held in Reykjavik. When I mentioned my enthusiasm about this conference to a colleague, they assumed I was excited to be heading to Iceland – oh, was that where it's being held? I hadn't registered where it was taking place. All I could think about was the opportunity to focus on identifiers for a few days. I wasn't interested in the location – just the topic.

Why do I love identifiers so much?

I appreciate identifiers for their essential role in linking metadata to the items they describe. Identifiers are the unsung heroes of the publishing world, ensuring as they do that information is

accurately linked, easily discoverable, and accessible to those who need it. But what I particularly appreciate and find fascinating is the community-driven aspect of identifiers. These identifiers are not simply IT keys. They are overseen and managed by groups of passionate individuals who are dedicated to their development, maintenance, and improvement. These communities, comprising librarians, publishers, researchers, and IT specialists, work tirelessly to ensure that identifiers remain relevant, effective, and adaptable to the ever-changing landscape of information creation and dissemination. Their collaborative efforts, driven by a shared passion for organization, standardization, and innovation, have given rise to robust and resilient identifier systems we know today that underpin the data and information ecosystem.

What identifiers are we talking about?

In this article I will concentrate on the three principal identifiers used in the publishing world: the International Standard Book Number (ISBN), the International Standard Serial Number (ISSN) and the Digital Object Identifier (DOI). I have had firsthand experience of working with all three of these, as OP has been a registration agency for them since 2001, 2002 and 2004 respectively.

Could it be said that there is such a thing as too many identifiers? Well, certainly, here at OP, we are sometimes asked this question by our authors. But, as you would expect, I can't agree. The fact is that each identifier possesses its own unique strengths and is tailored to specific formats and types of content. When we assign identifiers to content published by the EU institutions, it is not a one-size-fits-all approach. We have to take into account the distinct characteristics of the content being identified. By using the right identifier for the right purpose, we can ensure that our content is accurately described, easily discoverable, and accessible to the intended audience. And don't forget that identifiers also contribute to the long-term preservation. This diversity of identifiers should be considered a strength, not a weakness, as it allows us to provide a rich and detailed framework for organizing and connecting our content.

Let's start with the ISBN

Every booklover is aware of the ISBN although surprisingly few fully appreciate its purpose. It is often underappreciated and misunderstood. A few years ago I was talking with a friend who had just started using MyLibraryThing, a software that enables you to manage your personal book collections. She contacted me in a state of frustration as she was trying to upload her first book, a particular favourite, and the system kept proposing the US edition, instead of the UK one. Trying to understand the issue, I expressed surprise that the ISBN she was surely using to register her book was giving a false result. At this she looked quite embarrassed and had to admit that, whilst she was aware of the ISBN, she had never thought it would be of use to her here. Once she started using it did, she was able to upload her entire collection very speedily. The ISBN accurately identified the correct edition and format of each book in her collection, and even retrieved the relevant metadata to fill out all the fields.

This anecdote may seem trivial, but it illustrates a common misconception about the ISBN. Many

people are unaware of the power and versatility of this unique identifier, which underpins the global book trade but is also used by libraries, both public and personal. The ISBN may not always get the recognition it deserves, but its impact on the book world is undeniable.

For those unfamiliar with its history, the ISBN started as a concept back in 1966, introduced by UK retailer, W.H. Smith. They needed to solve a real problem as they were in the process of setting up a computerised book warehouse and needed a unique identifier to manage their book supply chain. And so it started. Interest in this approach soon spread and the International Standards Organisation (ISO) eventually became involved, resulting in the ISBN being recognised as an international standard in 1970[2].

Over the years, the ISBN has evolved to cover not just books, but also chapters, multimedia, and other content. Its enduring success can be attributed to its ability to adapt seamlessly to the evolving publishing landscape, while remaining faithful to its core purpose: providing a standardized and unique identifier for published content. As the publishing industry continues to shift and grow, the ISBN has demonstrated its versatility and resilience, solidifying its position as a cornerstone of the book world.

The ISBN system is managed by the International ISBN Agency whose activities are overseen by a board of directors. These directors are elected from the global pool of the registration agencies who are responsible for the assignment of ISBNs within their country/community. The agencies themselves come from the library and publishing worlds, often represented by national libraries or publishers' associations. This combination of working together at a global level coupled with a deep-rooted understanding of the needs of their national publishing landscape is what makes the system so effective, ensuring that the ISBN remains relevant to the needs of the communities it serves. I have been privileged to serve on the board for several years now and appreciate the diversity of my fellow board members, coming as they do from different parts of the world and representing publishers associations and national libraries.

ISBN at OP

At the Publications Office, we assign the ISBN to all monographic works. We don't sell books as such as our published content is made available free of charge through our website[3]. But whilst we aren't directly concerned by the commercial book trade (the primary function of the ISBN), the ISBN helps our publications appear alongside their peers on virtual library shelves around the world and through discovery services' collections. We manage the prefixes for the publishers based on their publishing output over the preceding five years. As soon as they have formally registered their work (including number of languages and formats to be produced) in our production system, the ISBNs are attributed in the system to their books in a semi-automated way. Sometimes we do have to reach out to the authors, to clarify the content as we are careful not to assign ISBNs to what could be considered ephemera, including flyers and items such as colouring books with no informative text. But in general the assignment of ISBNs does not require human intervention.

The service is one particularly appreciated by our authors. Apart from the obvious benefits of

ensuring their volumes are found in catalogues and databases alongside those of commercial publishers, they feel that the ISBN lends a certain authority to their work as it is seen as a stamp of authenticity. And who would argue with that?

And what about ISSN?

The International Standard Serial Number (ISSN) has a fascinating history that parallels the development of the International Standard Book Number (ISBN). Once again, the need emerged from the publishing community, looking for a standardized identifier for serial publications, such as journals, magazines, and newspapers. In response, the American National Standards Institute (ANSI) developed a standard for identifying serial publications, which was published in 1971 as ANSI Z39.9, also known as the Serial Publication Number (SSN). This standard provided a unique identifier for each serial publication at title level, making it easier to catalogue, index, and distribute these publications. Around the same time, ISO began drafting a standard for an international serial number, which would eventually become the ISSN. The first edition of the ISO standard was published in 1975, and it has been regularly revised and updated since then.

As for its organisation, in 1974, an agreement was signed between France and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to establish the ISSN International Centre in Paris, France. The Centre was tasked with coordinating the assignment of ISSNs worldwide, maintaining the integrity of the standard, and providing support to national centres and publishers. Today the ISSN International Centre plays a crucial role in ensuring the consistency and uniqueness of ISSNs across different countries and languages. As in the case of the ISBN, the central agency is supported by its user community of registration agencies assigning ISSNs at a national level. Through annual meetings of this community as well as regular board meetings, it ensures the standard remains relevant to the changing landscape. Over the years the standard has been revised to include the emergence of electronic publications and more recently content online.

ISSN at OP

We are aware that EU content is often made available through newsletters and journals. Because of our multilingual publishing strategy as well as our multi-format production approach to cater for print, online and accessibility requirements, we can often have the same content made available in 24 languages and in 2-3 formats. The ISSN enables us to link all these different outputs so that an end-user can see what we have in which languages and what formats. It not only contributes to improved discoverability but also facilitates the overall management of these titles.

The ISSN has proved invaluable as the EU has expanded to take on new member states and consequently new languages. It has enabled us to connect the resulting new language titles to their 'sibling' titles and thus provide a streamlined online experience for our users no matter what language they search in.

At OP we have a particular practice of creating distinct, individual metadata records for each and

every serial issue, rather than creating a holdings record at ISSN level as is the standard practice in libraries. We then use the ISSN found in the metadata of these individual issues to create a link on our Portal enabling users to click and see all other issues in that series.

We manage the allocation of ISSNs via our production system and regularly feed the ISSN International Register. It can be a challenging task as authors don't always fully appreciate the benefits of a stable key title, often tweaking it in small ways for each new publication. However, as they have understood the purpose of this identifier so they have improved their compliance with the rules.

As with ISBN, OP actively contributes to the ISSN network. Through this group, it is able to exchange best practices and expertise with other members of the network as well as contribute to the ongoing evolution of the ISSN standard.

And finally the DOI

As in the previous two examples, the DOI was born out of a real need expressed at the time by the American Association of Publishers (AAP). There is a quote by Tim Berners-Lee that summarises the issue very nicely:

What makes a cool URI?
A cool URI is one which does not change.
What sorts of URI change?
URIs don't change: people change them.

As the internet started to expand in the 1990's, there was a very real issue with content being published and then moving to a new web site/page. The challenge was to identify this movable content in a standardised way, to create a persistent, reliable identifier for this content no matter where it moved. In response to this need, the International DOI Foundation was created to administer this new identifier called the Digital Object Identifier. From the beginning there was some confusion as to whether this was only applicable to digital content. I was lucky enough to meet Norman Paskins, who was the driving force behind the creation and adoption of this new identifier, and he always stressed that the DOI was a digital identifier of an object, NOT an identifier of a digital object. As such the idea was that it could be applied to anything and indeed the reality today is that it is applied to a wide range of objects, from journal articles and books through to movies and now even to building materials.

Once again, like the ISBN and ISSN, there is an active community behind this identifier, comprised of the various registration agencies who make up the board of the DOI Foundation. Whilst these agencies often come from different business domains, they are united in their commitment to developing services based on this persistent actionable identifier, sharing these with other agencies to help build user-centric solutions that bring together the content identified by them in a unified way. All the agencies share responsibility for assuring the central infrastructure and thus the DOI continues to grow in line with the needs of its community.

DOI at OP

The Publications Office was an early adopter of this identifier. At the beginning we applied it to any publication that also had an ISBN. It was about the same time we were starting to reach out to libraries interested in integrating our collection in their catalogues by taking our metadata records. The presence of a DOI in the metadata we shared with them give a reassurance that our content would not disappear overnight and that they could include our content in their catalogues with confidence. Soon we had discovery services taking our records to include in their collections too.

The DOI was essential to us when we moved from our previous website, EU Bookshop, to our new Portal. In theory all our DOIs would have returned a 404 error message if we had done nothing but we were able to update the URL in the metadata of all our DOIs so that the day of the switch from one web site to another, all our DOIs were also updated and continued to take users to the identified content as before. This was exactly the original intention of the DOI, to provide seamless redirection for anyone with the link.

However, not everyone understands the mechanics of the DOI and prefer to believe that there is something magical that happens. One of our authors started to use the DOI to identify articles published in their online journal. We provided them with the technical capabilities and they were then able to manage the ‘minting’ of the DOIs themselves. All worked very well - until the day that they moved all their content to a new website. They contacted us in a panic – none of their DOIs were working anymore. How was that possible? We had told them that the DOI would always point to the content it identified. So we had to explain to them that the magical part of the DOI was that, for the user, the DOI always pointed to the content no matter if it had moved or not. However the metadata of the DOIs would need to be updated to reflect this change. Once again though it was a relatively simple procedure whereby the metadata of several hundred DOI were updated in a single action and immediately the service was fully restored.

Application of the DOI at OP has grown since those early years. We apply it to journal articles, data sets, and even grants. This network of application now enables us to identify figures and tables in publications and connect them to the originating data sources. So a reader of an EU report can see a table presenting some statistics and then click on the DOI to access the raw data.

We have also worked with other registration agencies to ensure interoperability between our DOIs, so that a user looking for the metadata of a DOI doesn't need to know which registration agency issued it, providing a seamless service.

And so...

As you can see, these identifiers have each stood the test of time because they were based on real business needs. Obviously, the fact that they are all now ISO standards has contributed to their global success. But I believe that what keeps them relevant are the communities involved in their daily application, etc

So, I hope that now you can understand why I am an ID nerd. Identifiers are not simply strings of characters and/or numbers. For those of us who have spent years working with them, they are the unsung heroes of the publishing world. The International Standard Book Number (ISBN), the International Standard Serial Number (ISSN), and the Digital Object Identifier (DOI) are the keys to unlocking the power of information.

As a librarian and identifier enthusiast, I have seen firsthand the impact they can have on the way we discover, access, and share information. From the humble beginnings of the ISBN as a solution to a real problem in the book supply chain, to the DOI's role in creating a persistent and reliable identifier for digital content, each of these identifiers has a unique story to tell.

But what makes these identifiers so special is the communities that surround them. The registration agencies, the publishers, the librarians, and the researchers who work together to develop, maintain, and apply these identifiers are a testament to the power of collaboration and standardization. They are the ones who ensure that these identifiers remain relevant, effective, and adaptable to the ever-changing landscape of information creation and dissemination.

As we look to the future, even in current AI climate, it is clear that identifiers will continue to play a vital role in the way we manage and share information. Connections in the information world are not 'magic' – they are underpinned by identifiers and their associated metadata. Each of these identifiers has a unique strength and a specific purpose, and together they provide a rich and detailed framework for organizing and connecting our content.

So, the next time you come across one of these identifiers, take a moment to look beyond the number itself, remember the story behind it, and the community that makes it possible. These identifiers may seem small and insignificant, but they are the building blocks of a global information infrastructure that is essential to our daily lives. And for those of us who are passionate about identifiers, we know that they are not just numbers and letters - they are the keys to unlocking the power of knowledge.

[1] [About us: mission, vision, values - About Us - Publications Office of the EU](#)

[2] [ISO 2108](#)

[3] [Home - Publications Office of the EU](#)