BUSINESS PLAN 2023

ISO/TC 46 - Information and documentation

EXECUTIVE SUMMARY

The need for harmonized standards in the world of information is global. The widespread use of the Internet has increased the interest in interoperable standards and compatible information systems.

Standards developed under ISO/TC 46 “Information and documentation” aim to facilitate access to knowledge, culture and information and to help to develop appropriate automated tools, computer systems and services to disseminate the information that is curated and collated by libraries, archives, museums, publishers and other content industry participants. These standards give rules to identify, describe, index, classify, access, select, exploit, communicate, exchange and preserve, both paper-based and digital information. Standardization in the field of information and documentation impacts various professional communities and industries.

Standards for paper-based information evolve to meet the changing requirements for retention, dissemination, marketing, sales, archiving and digitization. Digital information changes rapidly along with the technology that produces and distributes it. These trends are reflected in the expertise of, and the work undertaken within, TC 46 sub-committees. E-information is increasingly networked and sought on systems using a variety of formats and storage media. The different methods, formats and media through which information is accessed and transferred cannot be considered in isolation but must address system-wide interoperability.

TC 46 standards focus on issues faced by libraries, archival institutions, information centers, museums and the commercial supply chain in discovering, describing, preserving, storing and analyzing information whether that content is textual, graphical, audio, video or multi-media based. Getting the information about a resource (metadata) correct is critical for navigating repositories, maximizing discoverability and optimizing marketing and revenue opportunities. TC 46 standards also affect organizations, content industries, and media production. These standards are used widely by people searching for information, by students and researchers in information science, by linguists and translators, by archivists, by indexing and abstracting services, by discovery tools, by retailers and aggregators.

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1 INTRODUCTION

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work program with expressed business environment needs and trends and to allow ISO/TCs to prioritize different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for project development.

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: ISO (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of IEC (International Electrotechnical Commission), and most of the telecommunications technologies, which are largely the responsibility of ITU (International Telecommunication Union) and IETF (Internet Engineering Task Force).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 140 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverables of ISO are International Standards and related specifications[1].

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its Technical Committees are also able to offer the ISO Technical Specification (ISO/TS), the ISO Publicly Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and do not have the same status as an International Standard.

ISO also offers the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.

[1] http://www.iso.org/iso/home/standards_development/deliverables-all.htm

2 BUSINESS ENVIRONMENT OF THE ISO/TC 46

2.1 Elements of background

The structure of TC 46 is defined to meet market needs and it is described in document TC 46 N 1597.

> **Current scope of ISO/TC 46 "Information and documentation":**
> *"Standardization of practices relating to libraries, documentation and information centers, publishing, archives, records management, museum documentation, indexing and abstracting services, and information science".*

The market served by TC 46 is characterized by a high degree of interdependence, economic concentration and global digital shift. Market players include for-profit (such as system vendors, and publishers for example) and non-profit institutions (such as libraries, documentation centers, archives, and museums). There is growing convergence between for-profit and non-profit players as organizations assume multiple roles – often by supplying services to another institution and to the end user or consumer. The market is also moving to encompass the broader business environment as organizations become increasingly aware of the need to control, manage, and effectively utilize their records and internal knowledge to contribute to the information society.

Media companies, institutions and institutional groups relying on TC 46 standards have overlapping responsibilities in the supply chain. They represent the creation, dissemination, management, preservation, and consumption of information in all types of media: print, audio, visual, digital, etc. The multi-faceted nature of the topic and the interlacing of individual aspects from various specializations have to be combined in order to ensure that documentation standards are soundly based.

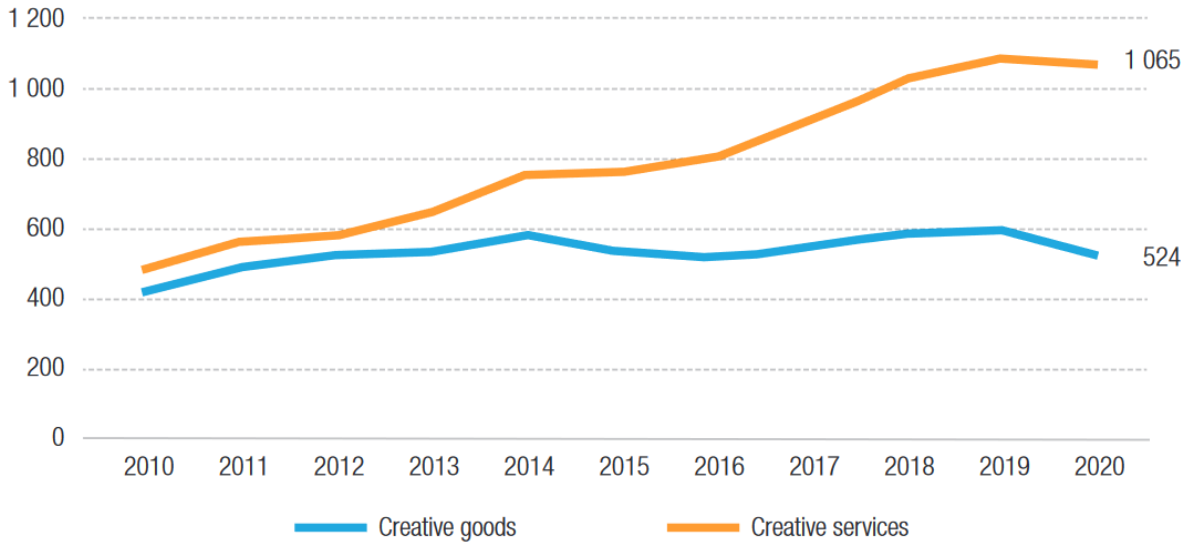
2.2 Trends in creative goods and services

Creative and cultural industries[2] (CCIs) are major economic actors in the global knowledge society. The cultural sector accounts for 3.1 percent of global gross domestic product (GDP) according to UNESCO[3]. The United Nations Conference on Trade and Development (UNCTAD) estimates that in 2020, creative goods and services[4] represented 3 and 21 per cent of total merchandise and services exports, respectively. In addition, cultural and creative industries provide 6.2 per cent of all employment, generating nearly 50 million jobs worldwide, and employ more young people (15–29-year-olds) than other sectors[5].

Trade in creaive goods and services generates increasing revenues for countries (figure a). The global exports of creative goods increased from US$ 419 million in 2010 to US$ 524 million in 2020, while world exports of creative services increased from US$ 487 billion to almost US$ 1.1 trillion during the same period. In the past few years, there was an increase in the exports of software and research and development services and a "dematerialization" of certain creative goods due to digitization with creative goods increasingly becoming creative services[6].

[2] Visual arts, Advertising, TV, Newspapers & Magazines, Books, Architecture, Performing Arts, Music, Film, Gaming, Radio
[3] UNESCO (2022). Re-shaping policies for creativity: Addressing culture as a global public good. Available at https://unesdoc.unesco.org/ark:/48223/pf0000380474
[4] https://unctadstat.unctad.org/EN/Classifications/DimHS2012Products_Creatives_Hierarchy.pdf.
[5] https://unctad.org/system/files/official-document/ditctsce2022d1_overview_en.pdf
[6] Ibid.

Global exports of creative goods and services, 2010–2020
(Billion US$)



Source: UNCTAD.

Developed countries have been exporting significantly more creative services than developing economies accounting for 82.3 percent of all creative services exports in 2020. Software services (accounting for 39.3 per cent of total creative services exports in 2020) and research and development (33.2) are the most exported creative services. They are followed by advertising, market research, and architecture (14.8), audio-visual (8.6), information (3.5), and cultural, recreational and heritage services (0.5).[7]

This overview is far from exhaustive but it gives some information about the importance of creative goods and services in the global economy. The sectors of audio-visuals (films and CDs, DVDs and tapes), performing arts (musical instruments and printed music), publishing (books, newspapers, and other printed matter) are impacted by this momentum and undergoing a digital shift. Many issues arise that need to be addressed through standardization.

2.3 Central role of heritage organizations

Heritage organizations (i.e. archives, libraries, museums) are also served by TC 46. For the past ten years, several studies[8] have emphasized the impact of these sectors on economy, community development, literacy and education by focusing on specific national environments[9]. Regarding libraries, IFLA has published its Library Map of the World[10] including 2.8 million libraries worldwide and providing key figures on collections and visitors. Regional statistics are available for museums[11] which reflect the steady increase in collections and number of visitors.

The UNESCO's *Recommendation concerning the preservation of, and access to, documentary heritage including in digital form*[12] stresses the importance of standards regarding "preservation, integrity,

[7] Ibid.
[8] See *Libraries matter : Impact research*. American Library Association. http://www.ala.org/research/librariesmatter/ and *Where's the value? The worth of public libraries* / K.M Sørensen. https://doi.org/10.1016/j.lisr.2020.101067 and *Sustainability, economic value and socio-cultural impacts of museums*/ A. Orea-Giner et al. https://doi.org/10.1080/09647775.2019.1700468
[9] See also *Scholarly Reading and the Value of Library Resources: A Survey. 2012* https://issuu.com/carenmilloy/docs/uk_scholarly_reading_and_the_value_of_library_reso . See also *Measuring Museum Impact*. 2013. http://online.ibc.regione.emilia-romagna.it/I/libri/pdf/LEM3rd-report-measuring-museum-impacts.pdf
[10] https://librarymap.ifla.org/map
[11] See EGMUS at http://www.egmus.eu or American Alliance of Museums at www.aam-us.org.
[12] UNESCO. Recommendation concerning the preservation of, and access to, documentary heritage including in digital form. 2015. http://unesdoc.unesco.org/images/0023/002339/233916e.pdf

authenticity and reliability, access and use"[13]. The promotion of interoperability across memory organizations and other stakeholders is also essential to UNESCO which encourages producers to provide "structured, machine-readable and linkable content whenever possible."[14]

2.4 Evolution of scholarly communication

The dematerialisation of scholarly communication has made it more dependent on computer and communication technologies. Identifiers[15], and notably those developed under the TC46 umbrella, are commonly used in scientific research for the identification and description of research results, e.g. for print and digital journals (ISSN) and for articles (DOI). Scientific publishers, both commercial and non-profit, commonly use these identifiers in their internal production tools and in their transactions with content providers, libraries, and researchers. Beyond the identification of documents, it is the entire research ecosystem that has become the scope of identifiers with the introduction of the International Standard Name Identifier ISNI (2012) and the Research Activity Identifier RAID (2022).

Contemporary global scientific production has acquired great visibility thanks to the Internet, where millions of documents produced by millions of researchers employed by as many organizations are accessible free of charge or for a fee. Between 2000 and 2019, the number of researchers has increased from an average of 6 per 1000 employees to 9 per 1000 in OECD countries. In India, the number of researchers grew from 110 to 255 per 1 million between 2000 and 2017. Because of this staggering growth and the difficulty of publishing in increasingly selective and expensive scientific journals, some researchers have questioned the established model whereby research is funded by government authorities while a majority of its results are made available by commercial publishers. This critique was articulated in the Budapest Open Access Initiative Declaration[16] (2001) which called for the creation of Open Access journals and institutional open science repositories. The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities[17] (2003) reinforced this international momentum in support of open science.

Open Access (OA) has thus become a powerful trend in publishing which has an impact on all players in the scholarly value chain. Content and data are produced by scholars and made available in publications or repositories under OA licenses. Business models based on Article Processing Charges (APCs) are causing disruptions in the publishing market with authors, researchers and students being overwhelmed with the plethora of media they have to choose from to get their work published. The publishing market is undergoing heavy restructuring globally and there are numerous issues regarding the quality of digital publications. Publishers and libraries can join forces to promote quality open access and draft guidelines and protocols for OA publications.

The identification of research outputs at local, national, regional and global levels has become a key issue because the research process becomes more dependent on information systems and infrastructures such as Current Research Information Systems (CRIS) which can be considered as platforms. "The term "platform" as defined today in a digital context, now includes giving people and companies "a platform" in the figurative and political sense, as well as the infrastructure through which they can sell products and services, share data and content, express themselves, and connect with other people. [...] Platformization is used to describe a company transitioning from a business selling products to one managing direct transactions between two or more actors in a platform-mediated network."[18] The value production of these platforms is now based on building communities of active researchers who share their results, initiate collaborations, analyze research data and establish metrics.

2.5 Developing and maintaining services to user communities

[13] Ibid.
[14] Ibid.
[15] See G. Béquet. "Identifiers and Open Science: Elements for a socio-technical analysis of ORCID". *International Journal of Knowledge Engineering and Management*.https://doi.org/10.29327/265007.11.29-8
[16] https://www.budapestopenaccessinitiative.org/
[17] https://openaccess.mpg.de/Berlin-Declaration
[18] P.C.S. Andrews. "The Platformization of Open," In *Reassembling Scholarly Communications: Histories, Infrastructures, and Global Politics of Open Access,* ed. by Martin Paul Eve and Jonathan Gray. MIT Press: Cambridge, MA, 2020. pp. 265-276.

Digital publications are still evolving. As the use of e-readers and enhanced smartphones becomes more prevalent and market opportunities appear more promising, large corporate publishers and technology start-ups have begun to participate more in digital innovation. Whereas a few years ago digital journals and books largely mimicked their print counterparts, they now tend to be multimedia enriched digital items whose presentation and associated metadata can sometimes lack standardization hence causing interoperability issues. Interoperability of description and content formats across the industry is crucial for digital publications in order that they flow more easily between the producer and the customer with minimal human or institutional intermediation. “Standardization is needed within the academic e-book publishing industry in order to accurately represent products and to allow librarians to make informed purchase decisions without going on an information scavenger hunt for every title.[…] Publishers and libraries need to speak the same language in order for publishers to clearly market their products and libraries need to know what they are buying.”[19] Granularity and scalability of digital contents are big challenges. The end-user may be interested in a chapter of a monograph or in a figure of an article each of which will need to have an identifier to facilitate easy access. Some content such as data or survey results may only be added or linked to a publication at a later stage thus requiring that different versions of the publication are tracked, or persistent linking between the article and research data.

The digital shift in publishing requires huge investments in technical infrastructures and specialist human resources which are made possible through concentration of media ownership. The publishing industry is global with media groups consolidating at a fast pace. “Vertically integrated publishers have an advantage in terms of the information they have access to by being able to control and collect metadata. […] Metadata and information about customers have long been central in the publishing world but their significance have increased enormously with the digital development, which has led to radically changed business models and opportunities to collect information about consumers.”[20] Publishers can now have direct access to end-users and provide them with services which were previously managed by intermediaries. Digital content carries its own metadata which needs to be standardized to be reusable by heterogeneous information systems across the distribution chain. It is also important to link seamlessly digitized legacy content and digitally-born content, especially for the scholarly record in order to support the sound development of scientific knowledge.

Digital preservation of online content is also key to end users who need long-term access to resources, to creative industries that want to protect their assets and to heritage organizations which want to keep access to content in the long run. They should share good practices and common standards to preserve digital content and maintain technical interoperability. They need a mutual platform for discussion and exchange of information on technologies and processes. Most of the content is born digital and available on the internet. Mass digital online preservation has become a crucial issue. “The amount of new digital content created in 2011 amounts to several million times that contained in all books ever written. OECD figures show that internet traffic has risen by 13,000% in the last decade with more digital information created in 2008-2011 than in all previous recorded history.”[21]

2.6 Information assets in the private sector

The current global digital transformation, and the general evolution of the society, call more and more for increased transparency, accountability, data protection, security, interoperability and infoshare within and between organizations. This implies a solid strategy for data, information and knowledge management and information governance which should play a key role in supporting digital transformation initiatives and driving e-Governance. Information Governance is a "high level" vision of information management. Many governments and large organizations now aim to act at this level and not at more specific levels such as "records management" or "digital preservation".

[19] Julia Proctor (2013). How old is that E-book: A Call for Standardization in Publisher-Provided E-book Publication Dates. Journal of Electronic Resources Librarianship, 25:2, 100-114, DOI: 10.1080/1941126X.2013.785288
[20] Anna Maria Rimm (2014). Conditions and Survival: Views on the Concentration of Ownership and Vertical Integration in German and Swedish Publishing. Publishing Research Quarterly. DOI:10.007/S12109-014-9353-8
[21] IFLA Trend Report. 2015. http://trends.ifla.org/

Information governance within companies is a major issue and remains a work in progress. Past strategies based on the principle of "Keeping it just in case" are no longer adapted and bearable and must be thoroughly reviewed and adapted to current issues.

In essence, the business sector has a business-oriented approach to information management that needs to demonstrate its ability to meet one or more of the following key challenges:

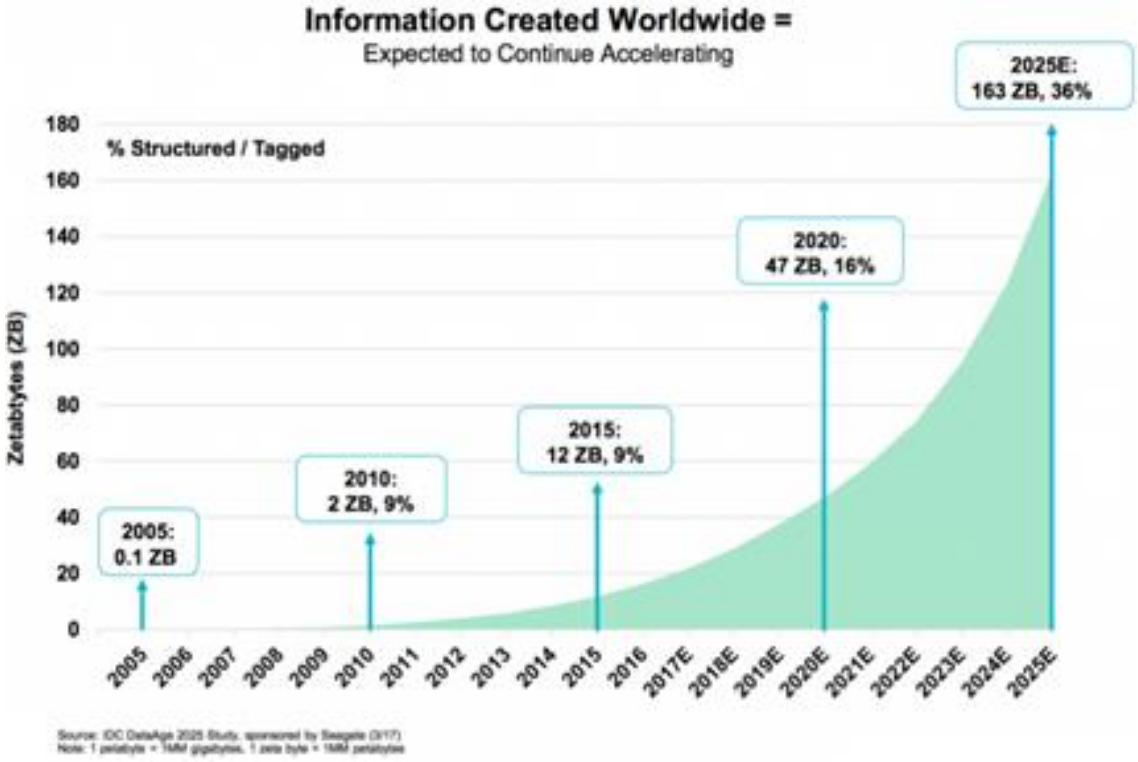
- to help ensure compliance with its obligations,
- to reduce risk,
- to improve employee and business efficiency,
- and, finally, to generate value that can be translated into improved operational and financial results for the company.

Gartner Group - 1. Align File Analysis Use Cases, Security, Budgets and People[22]

Thus, the relationship between companies and their information assets has changed. It has become necessary for companies to review their processes, organizations and tools in order to meet today's challenges of "keeping information as long as necessary and disposing of it when the time comes". In this context, TC46 has supported this move with the publication of several standards in 2022 [23] and with more to come[24].

This necessary change has been catalyzed by numerous events in recent years, such as the increase in computer attacks, the Covid pandemic, the unstable international context, the acceleration of impacts related to global climate change, and the exponential increase in the volume of digital information worldwide[25].

[22] Gartner Group - 1. Market Guide for File Analysis Software, 2020.
[23] ISO 13008 :2022 : Digital records conversion and migration process, ISO 30302 :2022 : Management systems for records — Guidelines for implementation, ISO 24143 :2022 : Information Governance — Concept and principles
[24] e.g. ISO/CD 18128 : Information and documentation — Risk assessment for records processes and systems
[25] IDC, DataAge 2025 Study, The Digitization of the World, 2018



In the coming years, companies will have to transform themselves to ensure that they can meet the challenges of cybersecurity[26], to better manage their information assets wherever they are located in order to control the increase in volumes, to rethink the ways in which information is accessed and used, and to take into account the environmental and ecological impact in any initiative they undertake.

2.7 Emerging technologies

The use of industry 4.0 technologies opens new opportunities for the creative economy. Three-dimensional (3D) printing, artificial intelligence, augmented reality and virtual reality (AR/VR), blockchain, cloud computing, drones, and the Internet of Things (IoT) are driving the fourth industrial revolution. They have created new avenues for producing, distributing, and consuming creative goods and services (i.e., e-commerce and streaming) while reaching a more comprehensive range of consumers globally.[27]

The Internet of Things (IoT) is defined as “an intelligent, invisible network fabric that can be sensed, controlled and programmed, through which the physical world objects become intelligent and communicate independently online. [...] radio frequency identification is used to make any object to become smart.”[28] ISO 28560 under the umbrella of ISO TC46/SC4 addresses RFID in libraries. Beyond this specific standard, IoT is much relevant to our community as it can bridge the gap between the physical environment and the cyberspace of computing systems, e.g. streamline the logistics of analog materials across the supply chain. IoT can rely on blockchain technologies to enhance interoperability, improve privacy and security and ensure scalability[29]. IoT is also based on big data, i.e. huge datasets with specific characteristics (volume, variety, velocity, veracity, value and complexity) that require computation and analysis.

[26] McKinsey et Company - Perspectives on transforming cybersecurity, 2019
[27] Ibid.
[28] O. Bongomin, G.G. Ocen, E.O. Nganyi, A. Musinguzi, T. Omara. *Exponential Disruptive Technologies and the Required Skills of Industry 4.0*. Journal of Engineering, vol. 20, 2020. 17 p. Available at https://www.hindawi.com/journals/je/2020/4280156/
[29] H-N. Dai, Z. Zheng, Y. Zhang. Blockchain for Internet of Things: A Survey. 2020. 19 p. Available at https://arxiv.org/pdf/1906.00245.pdf . See also A. Dorri, S. S. Kanhere, R. Jurdak. *Blockchain in Internet of Things: Challenges and Solutions*. Available at https://arxiv.org/ftp/arxiv/papers/1608/1608.05187.pdf.

Cloud computing is another technology that has provided support to educational and scientific services by remotely allowing users to access applications and data and resources over a network. E-learning solutions, communication activities, teamwork, administration and many other sectors have benefitted from the development of cloud computing. The next stage is the emergence of virtual/augmented reality that will enhance the user experience in the same activities.

Identification of print and digital content units, content producers, rights-holders and other players in the value chain remains an important concern where content is more volatile and authorship more controversial. Blockchain technologies may bring solutions to this issue. Public blockchains can be applied to control the immutability of data in online scientific periodicals notably to identify various versions of a given content[30]. Blockchain technologies can be used in scientific publishing to incentivize peer-reviewing[31].

The exploitation of digital content through data mining has turned into an expanding market: data discovery and visualization, advanced analytics and knowledge mapping are all used to set up new services based on structured and unstructured data and content.

Last but not least, artificial intelligence that imitates human reasoning ability will spark new applications mimicking human speech, supporting translation, managing image recognition and further on indexation. Professional communities are gradually taking up this issue, such as the Artificial Intelligence for Libraries, Archives and Museums (AI4LAM)[32]. Gathering institutions and individuals in several working groups, the collective is aiming since 2018, to promote and enhance use of AI by collecting initiatives, in-depth study of available metada and processes as well as addressing the training issue. Governments, international and national policies are supporting and promoting this trend. UNESCO highlighted the need for ethics and released guidelines in 2021 on this matter[33] in the context of the future of learning. The European Commission by the report Opportunities and challenges of artificial intelligence technologies for the cultural and creative sectors released in 2022[34] offers a sector by sector analysis within the cultural industries field.

2.8 Quantitative indicators of the business environment

ISO/TC 46 plays a significant role in the presentation, indexation, classification, display, management and preservation of information across industrial and cultural stakeholders. The following standards are good examples of the scope of TC 46 actions.

International Codes:

- ISO 3166 "*Codes for the representation of names of countries and their subdivisions* " is widely used for the internationalization of information as well as for legal, regulatory, and diplomatic issues on the Internet, in trade transactions or ISO directives;
- Other standards such as ISO 639 "*Codes for the representation of names of languages*" (maintained by a joint working group of ISO/TC 37 "Language and terminology and TC 46) or ISO 690 "*Bibliographic references - content, form and structure*", are used worldwide.

Metadata specifications and protocols

- ISO 2709 "*Format for information exchange"* specifies an exchange format for bibliographic

[30] I. Tarkhanov. Application of public blockchain to control the immutability of data in online scientific periodicals. https://doi.org/10.1108/LHT-12-2018-0186
[31] S. Tanwar et al. Fusion of blockchain and IoT in scientific publishing: Taxonomy, tools, and future directions. https://doi.org/10.1016/j.future.2022.12.036
[32] The next event of their Fantastic Futures Conferences will be held from 15 to 17 November 2023 https://sites.google.com/view/ai4lam/events?authuser=0
[33] UNESCO. Draft text of the Recommendation on the Ethics of Artificial Intelligence, 2021 https://unesdoc.unesco.org/ark:/48223/pf0000377897.locale=fr
[34] Directorate-General for Communications Networks, Content and Technology (European Commission). Opportunities and challenges of artificial intelligence technologies for the cultural and creative sectors, 2022 https://op.europa.eu/en/publication-detail/-/publication/359880c1-a4dc-11ec-83e1-01aa75ed71a1

metadata produced by libraries. It is supported by most libraries which produce a machine readable catalogue.

- ISO 23950 "*Information retrieval standard"* enables seamless integration of searching between bibliographic databases. Most widely used integrated library systems support the standard, which makes it possible to copy catalogue bibliographic records between libraries.
- Identificateurs de contenu : les livres, les publications en série, les œuvres audiovisuelles et textuelles, la musique, les films, les vidéos et les enregistrements sonores doivent être identifiés individuellement pour permettre de retrouver les détenteurs des droits et les éditeurs ou toute autre partie concernée. L'ISO/TC 46 élabore et maintient une série de normes utilisées pour la numérotation internationale (ISBN, ISSN, ISWC, ISRC, ISAN, ISMN, DOI...). ISO/TS 22943:2022 Information et documentation - Principes d'identification peut être mentionnée ici comme une spécification technique établissant un ensemble fondamental de caractéristiques pertinentes et d'attentes pour les identificateurs, ainsi qu'un cas d'entreprise général. Elle illustre le rôle de coordination joué par l'ISO TC46 dans ce domaine.
- Gestion des archives : chaque organisation doit prendre soin de ses propres archives. Les entreprises, les agences gouvernementales et les institutions ne pourraient pas survivre sans une gestion appropriée des documents pour leur permettre de mener leurs activités et de répondre aux besoins opérationnels, aux obligations statutaires, aux exigences en matière de responsabilité et d'audit, etc. Grâce au vif intérêt suscité par la norme ISO 15489, "Information et documentation - Records management", et à son adoption réussie, le SC11 a converti ses normes et autres produits en une suite de systèmes de normes de gestion. Il fournit aux organisations un système stratégique intégré pour la gestion et l'exploitation de leurs ressources d'information en tant qu'actifs commerciaux, d'affaires et de connaissances.

2.9 Actors involved

Actors supporting the wider information supply chain include:

Creators of information content

Creators include public and private organizations and especially government agencies, authors' representative bodies, editors, writers, film and recording producers, compilers, performers, musicians, artists, illustrators, directors, composers and other people creating any information content. Usually these constituencies are represented through professional organizations, such as author's collectives, rights management organizations, professional societies, etc. This category also includes both individuals within business and business organizations themselves that are required to create and maintain records of their activities.

Distributors and information providers

Producers and distributors include publishers (both primary and secondary), distributors and information aggregators, information intermediaries and statisticians. These actors primarily deliver the information products from the creators to booksellers, audiovisual online platforms, and even direct to end users. Publishers in the commercial trade book sector, publishers focusing on scholarly markets, medical and reference publishers, corporate business information providers, and producers of sound recordings and videos are all included.

Cultural managers

Their activities include organizing and providing access to information for end users and supplying the right information products that satisfy their needs.

By promoting information literacy and providing support and training for effective use of information resources, cultural managers contribute to human development which is central to educational advancement and hence to economic progress. Cultural managers work in libraries, documentation centers, archive services, museums, and content vendors. They work in business organizations that are required, often by law, to have adequate frameworks in place for the protection and management of their information assets and evidence of information sources. It also includes archive repositories with

responsibility for ensuring the management through time of archival resources.

Customers using this information are end users. Standards for statistics and for the quality assessment of information supply guarantee the effectiveness and cost-efficiency of the services provided to them. The organization and supply process requires standards to enable services across institutions, including standards for data elements, protocols, search types, data formats, object descriptions, object classification, language codes, country codes, specification of access and security rules and forms of metadata. Managers may also need standards to acquire information objects. To enable various technologies to be used to organize and deliver information, specialized software is created along the lines of the relevant associated standards of TC 46.

Archivists and Records Managers
They create and maintain records of continued value accounting for the conduct of the current business of their institutions, organizations or companies. Records managers are responsible for designing, implementing, updating records and record management policies, procedures, systems and processes.

Standards for records management enable organizations to comply effectively and efficiently with government statutes and regulations regarding record-keeping.

Physical preservation of information in heritage organizations
A large market segment is responsible for archiving and preserving information for the benefit of future generations. These stakeholders range from preservation and conservation laboratories housed in large institutions to records management departments, sound and film archives maintained by associations and other organizations, to government and non-government archives. These groups have special needs for maintaining information, whatever its medium (print, digital, sound or image). They rely on a variety of suppliers for critical components in the archiving process. Standards are essential to carry out work under development in a cost effective and consistent manner.

Users and customers
Numerous users and customers practices are connected to ISO/TC 46 standards, for instance, everyone who :

- needs a book, an article, some music, a movie, images,
- uses a public or an academic library, an archive, a museum or some content provider,
- develops records management in his/her company,
- uses country codes or other TC 46 standards for trade, statistics or information exchange.

Information system and service providers
The companies that develop information systems or provide services for all the above mentioned actors are major users of TC 46 standards.

3 ORGANIZATION AND ASSESSMENT OF THE STANDARDIZATION PROCESS

3.1 Committee Internal structure

Five Sub-committees (SC) and five Working groups (WG) are under the supervision of ISO/TC 46.

Titles and scopes of the five sub-committees:

SC 4 - Technical Interoperability
Standardization of protocols, schemas, etc., and related models and metadata for processes used by information organizations and content providers, including libraries, archives, museums, publishers, and other content producers.

SC 8 - Quality - Statistics and Performance Evaluation
Standardization of quantitative and qualitative data for the management of information organizations and content providers, e.g., libraries, archives, museums and publishers.

SC 9 - Identification and Description
Standardization of information identifiers, description and associated metadata and models for use in information organizations (including libraries, museums and archives) and the content industries (including publishing and other content producers and providers).

SC 10 - Requirements for document storage and conditions for preservation
Standardization of requirements for storage and use of documents in libraries, archives and documentation centers, as well as practices related to maintenance and improvement of the conditions of preservation.

SC 11 - Archives/Records Management
Standardization of principles for the creation and management of documents, records and archives as evidence of transactions and covering all media including digital multimedia and paper.

Working groups active under ISO/TC 46:

WG 2: Coding of country names and related entities ;
WG 3: “Conversion of written languages”
WG 4: Terminology of information and documentation ;
WG 13: “Information Governance”

3.2 Coordination and liaisons

The TC 46 Coordinating Group consists of the TC’s Chair and SCs’ Chairs and Committee Managers, as well as convenors of MA, WGs and AhGs placed directly under TC 46 responsibility. It has assumed the role of "Strategic planning group" since the TC 46 was restructured in 2001.

The TC aims to strengthen this coordination in 2023, by initiating a debate on the implementation of a chair advisory group by the end of the year.

Regarding liaisons structure, as of 2023, the TC develops the following relationships network:

- 12 liaison Committees to ISO/TC 46
- 12 liaison Committees from ISO/TC 46
- 8 liaisons within ISO are based on reciprocity
- 24 liaisons with partners outside ISO rank A or B
- 1 liaison outside rank C participate at the level of a Working Group

In a context of often rapid change, the committee intends to initiate a reflection to prioritize and strengthen some of these working relationships.

For more details, see the link below:
https://www.iso.org/committee/48750.html

3.3 Representation and participation in the ISO/TC

The following link shows the P-members and O-members countries which participate in TC 46:
https://www.iso.org/committee/48750.html?view=participation

NB: Countries/ISO members bodies that are P and O members of the ISO

The number of countries involved in the development of ISO/TC 46 standards gives an idea of the audience of those standards. In 2023, TC 46 is composed of 42 P-members, and 32 O-members. The membership of the different ISO/TC 46/SCs and WGs would increase those numbers.

The committee is willing to encourage the further participation from O-members changing their status to P-members and the involvement of other countries located on various continents whose representatives would be welcome to express local interests and needs within TC 46 working groups.

Online and hybrid plenary meetings take place annually allowing for a more diverse audience to participate. Through liaisons, the technical committee can further reach out to potential new members by delivering presentations and holding specific sessions on the ISO standardization process.

3.4 Comprehensive roadmap: strengthen assets and tackling challenges

Standards developed within ISO/TC 46 “Information and documentation” aim to facilitate access to knowledge information and to help to develop appropriate automated tools, computer systems, and services to obtain this information owned by libraries, archives, museums, and companies. These standards give rules to identify, describe, index, classify, access, select, exploit, communicate, exchange, preserve both paper-based and digital information. Standardization in the field of information and documentation impacts on not only all the various cultural communities, but also all associated industries.

The need to develop harmonized standards in the world of information is global. The widespread use of the internet has renewed the interest in interoperable standards and compatible information systems. Even standards for paper-based information must evolve to meet changing requirements for preservation and archiving. But digital information is rapidly changing. It is increasingly networked and sought on remote systems using a variety of formats and storage media. The different methods, formats and media through which information is accessed and transferred cannot be considered alone but must be addressed globally for system-wide interoperability and preservation.

At its inception, TC 46 standards addressed the transfer and dissemination of information held by libraries, archival institutions, information centers, and museums. Now they are also helping organizations, companies and businesses which need to manage their records, or have to utilize language or country codes, or want to establish thesauri.

The following objectives are priorities in the work ahead:

- To optimize consistency, interoperability and harmonization of system and data or document workflow in order to offer perspective in a common effort in guiding public institutions as well as private vendors this includes;
    - defining a generic list of interoperability requirements applicable to all information systems;
    - developing case study and disseminating knowledge to ensure applicability and comprehensiveness;

- Defining protocols used in data exchange and aligning them with higher level encoding and transport protocols, specifying data (data elements and metadata, data models, data schema and record syntax) for data exchange;

- To assure the compatibility and coherence of the standards among themselves and avoid duplication of efforts, within and outside ISO/TC 46;

- To promote records management as a means to establish control and accountability for all kind of organizations;

- To ensure that standardization takes account of and reflects all the stages a document or a record goes through (production, encoding, identification, management, diffusion, preservation);

- To handle the continuing growth in size and diversity of native digital objects that soon may be as common as printed and digital text as carrier for science, information and culture (for example, streaming media, web archives, social networks, software or 3D objects);

- To build a collective capacity in supervising new topics and trends : artificial intelligence, connected items or blockchain;

- To play a major role in people empowerment and protection, regarding knowledge commons, access of a diverse information infrastructure and digital literacy using an expanded vision of quality management;

- To contribute accurately and more obviously in the global struggles linked to our field of expertise: personal data protection, digital governance, social and environmental responsibility of the data and information area.

3.5 Initiatives and means to achieve ISO/TC 46's defined objectives

The following action plan outlines four main areas and establishes requirements that will ensure the successful management of TC 46's activities.

Monitoring

To maintain an awareness system to keep up to date with trends in multiple sectors, there is a need to identify:

- new areas for standardization,
- existing work that can be used as input material for new standards,
- existing standards that can be fast tracked,
- standards in need of revision,
- standards that should be withdrawn,
- awareness triggered by sturdy dialogue with existing liaison partners or the need to find new ones.

TC 46 is eager to identify early on the need for standards in the field of emerging media and techniques by:

- considering market assessment and feasibility studies;
- monitoring new trends and entrusting the appropriate working group or subcommittee with investigations prior to the New Work Item stage;
- harnessing multi-sector awareness systems in ISO and beyond,
- mobilize the opinion of its members, provoke a public debate or commission a feasibility study to ensure that a proposal responds to a real need before committing to the standardization process;

Dialogue

TC 46 actively promotes and encourages comprehensive input based on as much multilateral dialogue as possible and driven by the following intentions:

- promote comprehensive input from all types of bodies committed to information and documentation issues, including libraries, publishers, archives, records management organizations, museums, public sector bodies, business organizations, retailers, systems vendors, etc.;
- identify potential new experts or bodies for inclusion and encouraging convenors of Working Groups to invite experts from relevant spheres;
- participate in professional events and exploit systematically multi-sector follow up and intervene officially in discussion lists and forums to maintain an ISO presence in emerging sectors;
- connect with the work of various interested professional communities to overcome linguistic barriers;
- encourage processes for consensus decision-making and stakeholder engagement within national standards bodies (NSBs) and liaison organizations; encouraging ISO national representative bodies to vote and express their comments;
- join efforts within ISO to strengthen dialogue with public and private actors as well as NGOs and other international bodies in a globalized perspective of the cultural and content industries sectors;
- capitalize on the opportunity of digital convergence of standards, practices and audiences of the GLAM sector in an open fashion to exchange with new partners and challengers.

Design

TC 46 strives to ensure consistency in the standards under development by:

- creation of timely and appropriate standards governing all facets of information and documentation;
- consistency among standards that deal with different facets of information and documentation and consistency with the other ISO standards;
- responsiveness to the needs of potential users to ensure that standards are optimized in terms of usability and relevance.
- maintenance of active liaisons with other ISO structures and other international organizations, whenever applicable;
- improvement communication within the ISO/TC 46 structure and within ISO in general; cross-checking standards content;
- investigate SMART standards development process.

Communicate

TC 46 wants to promote the use of standards it has developed by:

- Finalizing and publish standards in a timely fashion to ensure focus and coordinated efforts, and avoid obsolescence;
- Encouraging the private and public sectors in the use of existing ISO standards and show the value of using ISO standards;
- Disseminating information on each standard by various channels (seminars, workshops, leaflets,

websites, users' manuals and guidance documents, social media, etc., …);
- Planning and sponsoring events, when needed;
- Making standards known and accessible, assisting in their accessibility in relevant fields and in their implementation;

3.6 Assets and advantages

Here are the main benefits for the information community:

- Interoperability of information systems and resource hosts,
- Easier discoverability of content and resources,
- Cost savings through increased competition,
- Better delivery through more choice and more granular description,
- Increase of universal access to information while considering the interests of rights-holders,
- Preservation of cultural heritage,
- Sound bases for the development of enabling supporting systems,
- More accountable business practices.

As ISO/TC 46 standards provide the means to present, classify, sort, display, contextualize, manage, preserve and finally to use the information in all industrial and intellectual areas, the committee plays a very important role in the information society.

The sector of information and communication changes rapidly and standards are impacted by the following factors:

- Major technical evolution from creation, distribution, and storage of information in paper or digital form, and transformation of business processes from well-known paper based activities to innovative digital processes,
- Convergence of media into multimedia information objects, making the creation, manufacture, organization, dissemination and storage of information objects more complex,
- Burgeoning initiatives in distance learning and computer-based training that require new standards and challenge the traditional information distribution mechanisms,
- Growing interest in long term preservation of digital resources,
- Increasing interdependence and intersection with web standards which are developed outside TC 46 and even outside ISO, typically in IETF and W3C,
- Need for best practice-type guidelines in place of formal standards where media are new and sustainable standards cannot yet be developed,
- Pressure for shorter timescales for the development of standards with parallel pressure to ensure that they are globally accepted,
- Increasing dependence on technical outsourcing by various segments of the community, requiring standards to be developed in place to foster outsourcing in an efficient and confident way,
- Growing interest in ISO 9000 quality assurance standard, and development of tools to make it effective across the many facets of the Information and Documentation area,
- Increasing need for statistical methodologies and standards to use in this diverse and not-easily-quantified market,
- Multilingual research in a web environment,
- Definition of the best methodologies and tools for collection preservation in archives, libraries and museums.

There is not much point in developing quantitative indicators for most TC 46 standards. However, fairly accurate quantitative information can be provided about the use of identifier standards, which are listed below with their usage statistics. The international standardized numbers for books, serials, musical works, audiovisual works, music, texts, etc., developed by ISO/TC 46/SC 9 are globally used and implemented. Their use is extremely wide, including not only producers and vendors, but also users. It is not possible to list the diversity of uses of those identifiers.

For in depth information you may refer to the comprehensive list of standards regarding identifiers and follow your search to the corresponding official websites

https://www.iso.org/committee/48836/x/catalogue/p/1/u/0/w/0/d/0

TC 46 is also the key forum for maintaining standards defining the prerequisites for information systems and assessment and statistics policy throughout libraries and archives sector.

https://www.iso.org/committee/48826/x/catalogue/p/1/u/0/w/0/d/0

3.7 Factors affecting completion and implementation

TC 46 takes the following approaches to overcome some of the risks and challenges that could negatively impact completion or acceptance and use of ISO/TC 46's standards. They include:

Human factors

✓ Standardization work is dependent on the composition and expertise, of national committees among ISO's member bodies. Volunteer national experts are encouraged to remain in charge during the whole drafting and publication process of standards.

✓ Standards should be developed by experts who have the appropriate skills and background. TC 46 members are willing to identify and mobilize the best expertise regarding the projects at hand particularly in new areas of work.

✓ Newcomers to ISO/TC 46 work should be trained on ISO procedures to ensure proper development of a project (clarification of specific procedures).

✓ Secretariat support for ISO committee work is time-consuming and costly. National bodies should find sufficient funding to sustain international standardization activities.

Policy / Environment

✓ TC 46 is a large committee with a broad spectrum of activities and an extensive program of work. Coordination of activities by the TC 46 secretariat is a key aspect in the management of the committee which has benefited from the involvement of AFNOR since 2001 and from all national bodies responsible for the secretariat of TC 46 subcommittees.

✓ The “ebb and flow” in technology and resulting changes for the information domain is challenging for TC 46 members who strive to keep up with the pace of these evolutions while maintaining current international standards.

✓ Several other ISO and non-ISO bodies are working on different, but related, aspects of ISO/TC 46's work. These groups may not be sufficiently aware of ISO/TC 46 and/or prefer to develop what are commonly called "de facto standards” (free standardized documentation) in contrast to ISO's development procedures and publishing policies. It is necessary to promote ISO procedures which guarantee the balance between various national interests by supporting consensus decisions. It is also crucial to coordinate responses and liaisons to external initiatives which are related to TC 46 scope.

✓ Although TC 46 has been considered as being very library-oriented, it should be made clear that archives, museums, content providers, creative industries, and system developers are involved in the subcommittees. TC 46 does solicit experts and interest groups from various backgrounds to develop its projects.

✓ Delegates from some national bodies, particularly in developing countries, or liaison reporters

may lack funding to send their experts to meetings. The latter must be encouraged to participate in online and hybrid meetings.

✓ TC 46 standards and/or their implementation are not monitored at the national level, particularly when the ISO standard is used without an equivalent national standard.

Meetings : cost and schedule

In order to find the best ways to save costs and attract expertise, several possibilities could be explored, for example:

- prepare the meeting schedule 3 years in advance in order to enable delegations to plan budgets and experts' participation better;
- now hybrid meetings are the norm, better technology should make them more productive for both face to face and online participants;
- make information on working group meetings available in due time;
- link TC 46 meetings to relevant industry events whenever possible.

Initiatives to address factors affecting completion and implementation of the ISO/TC 46 Work Program

TC 46 strives to launch the following initiatives:

✓ Explore technological options to improve the sharing of information, knowledge and expertise within TC 46;

✓ Communicate the value of older standards in the TC 46 family within the membership, within ISO, and beyond;

✓ Take advantage of promotional information developed by ISO;

✓ Communicate and promote the value of the ISO standardization process with international and national non-ISO standardization bodies;

✓ Develop liaison relationships;

✓ Develop collaborative relationships at the international and national levels with standardization bodies in the domains of archives, museums, content providers, creative industries, system developers;

✓ Evaluate the balance of representation of interested communities within TC 46 and improve the balance by approaching under-represented constituencies;

✓ Improve and streamline the communication between committee members so that all members learn of relevant initiatives in a timely manner.

4 REFERENCE INFORMATION

This section gives an overview of the ISO/TC's structure, the scopes of the ISO/TCs and any existing subcommittees and information on existing and planned standardization projects, publications of the ISO/TC and its subcommittees.

Please check the links to ISO website to get an updated information.

Structure of the ISO committee

Current projects of the ISO technical committee and its subcommittees

Publications of the ISO technical committee and its subcommittees
Glossary of terms and abbreviations used in ISO/TC Business Plans

Resources for standards development

ISO provides resources such as directives and policies, code of conduct, documents describing the roles and responsibilities, policy regarding copyright, etc… to support the work of experts involved in standards development.