

standICT.eu 2026

ICT Standardisation Observatory and Support Facility in Europe

ICT Standardisation Landscape

Authors:

Knut Blind

Fraunhofer Institute for Systems and Innovation
Research & Technische Universität Berlin,
Chair of Innovation Economics

EDITION DECEMBER 2023



Funded by
the European Union

Module Objectives

After completing this module, you should be able to:

1. To **understand and apply** the different **criteria** for the classifications of **organizations and documents**, especially in the **Information and Communication Technology (ICT)** arena.
2. To be able to **describe** the role in **ICT standardization of Standards Development Organisations (SDOs), recognised SDOs, and industrial consortia**, as well as their **interplay**.
3. To **identify** the **characteristics of formal and de facto standardization**, and to be aware of the processes through which **de facto standards are adopted by SDOs**.
4. To **identify** the main **categories of ICT standards and documents**, including which type of documents may be produced by each organisation, and to get familiar with the **naming conventions**.
5. To **understand** the differences among **National, Regional and International** organizations, the benefits derived of their **coordination**, and to be aware of the main **agreements** and procedures supporting it.
6. To **understand** why **standards** are usually **referenced by legislation**, and the need to issue **standardization requests** when a societal need is identified in a specific area.

About The Author

Knut Blind



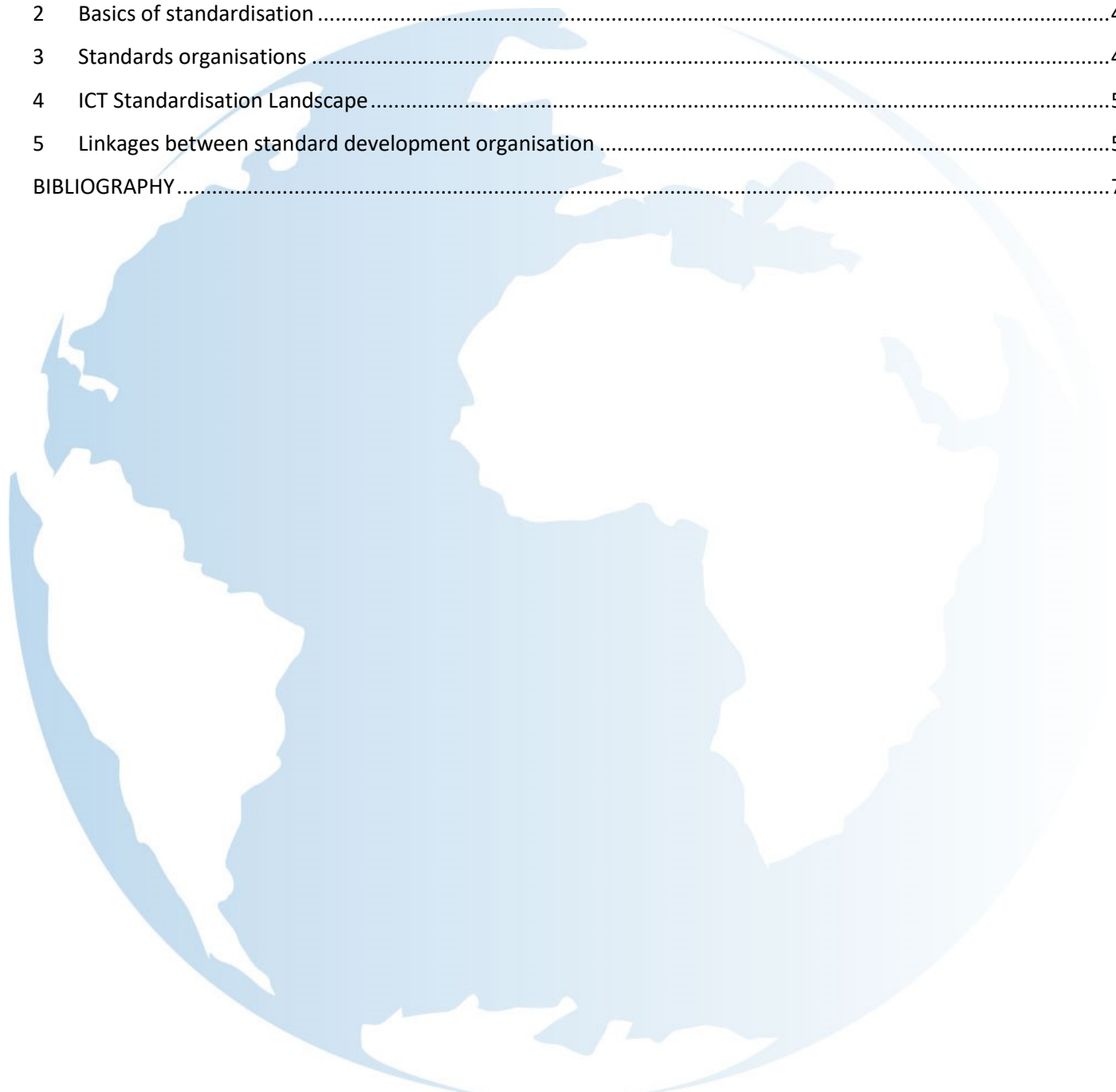
Fraunhofer Institute for Systems and Innovation Research & Technische Universität Berlin, Chair of Innovation Economics

Knut Blind studied economics, political science, and psychology at Freiburg University. During his studies, he spent one year at Brock University (Canada), where he was awarded a BA. Finally, he earned his Diploma in Economics and later his doctoral degree at Freiburg University. Between 1996 and 2010, he joined the Fraunhofer Institute for Systems and Innovation Research, Karlsruhe, Germany, as a senior researcher and, at last, as head of the Competence Center “Regulation and Innovation”. In April 2006, Knut Blind was appointed Professor of Innovation Economics at the Faculty of Economics and Management at the Berlin University of Technology. Between 2008 and 2016, he also held the endowed chair of standardization at the Rotterdam School of Management of Erasmus University. From April 2010 to September 2019, he was linked to the Fraunhofer Institute of Open Communication Systems in Berlin. Since October 2019, he has been head of the business unit “Innovation and Regulation” at the Fraunhofer Institute for Systems and Innovation Research. In 2012, he initiated both the Berlin Innovation Panel and the German Standardization Panel followed by a pilot of a European Standardization Panel launched in 2023. Besides numerous articles on patents, he published several contributions on standardization and further innovation aspects in refereed journals.

Table of Contents

Inhalt

1	Introduction	4
2	Basics of standardisation	4
3	Standards organisations	4
4	ICT Standardisation Landscape	5
5	Linkages between standard development organisation	5
	BIBLIOGRAPHY	7



1 Introduction

The webinar focuses on learning objectives related to ICT standardisation, covering criteria for classifying organisations and documents, the roles of SDOs and industrial consortia, distinctions between formal and de facto standardisation, and the processes of adopting de facto standards.

The introduction highlights the intricate and diverse nature of the standardisation landscape, attributed to the multitude of standard development organisations (SDOs) and the array of documents they generate. The webinar's primary objective is to furnish readers with fundamental concepts, enabling them to navigate the complexities of the standards ecosystem more effectively.

2 Basics of standardisation

The section explains the formal standardisation process, emphasising that it is an open procedure involving various individuals and organisations. This process, guided by international directives such as those from the Technical Barriers to Trade (TBT) Committee of the World Trade Organization (WTO), results in standards known as SDO standards. Standard development organisations (SDOs) implement formal standardisation procedures to ensure a fair and consensus-based approach, involving stakeholders like manufacturers, providers, consumers, and regulators. It is emphasised that standards, unlike regulations, are voluntary and not compulsory. It clarifies that standards are not exhaustive design rules and do not restrict the diffusion of items by law. It is also noted that standards may inspire regulations and highlights the focus on "SDO standards" throughout the subsequent discussion. Additionally, it distinguishes standards from regulations by pointing out that non-compliance with regulations can restrict market access, whereas non-compliance with standards does not have legal implications. Finally, it underscores that standards aim to define minimum requirements for an item, allowing for various compliant implementations.

3 Standards organisations

This section delves into formal standardisation and Standard Development Organisations (SDOs). Formal standardisation is described as a process with well-defined procedures, open to individuals and organisations, resulting in consensus-based outcomes. The process aligns with the six principles of the Technical Barriers to Trade (TBT) Committee of the World Trade Organization (WTO): Transparency, Openness, Impartiality and consensus, Effectiveness and relevance, Coherence, and Development dimension. SDOs, entities engaged in formal standardisation, respond to industry or societal needs.

The second part explains that some SDOs receive official recognition from regulatory systems as providers of standards, earning the label "recognised SDOs." The term "de jure" standards is used interchangeably with SDO standards, specifically for those adopted by legislation. The distinction is made that "de jure" accurately applies to a subset of standards that have legal backing. Particularly the recognition of Standard Development Organisations (SDOs) within the European Union (EU) context is explained. Regulation (EU) No 1025/2012 designates CEN, CENELEC, and ETSI as European Standardisation Organisations (ESOs). The EU achieves its objectives through various legal acts, including regulations, directives, decisions, and opinions. An example is Directive (EU) 2016/2102, which references the CEN/CENELEC/ETSI standard EN 301 549 regarding the accessibility of websites and mobile applications of public sector bodies.

Additionally, the text notes the existence of SDOs that are not officially recognised by authorities but are highly respected, such as W3C, IETF, OASIS, and IEEE. Despite lacking official recognition, these organisations have established procedures to ensure the quality of their standards. Notably, examples are provided, such as the W3C's Web Content Accessibility Guidelines (WCAG) standard being referenced by CEN/CENELEC/ETSI standard EN 301 549 on ICT accessibility requirements. The IEEE, while not officially recognised, follows rigorous processes through its IEEE-SA Standards Board, exemplified by the IEEE 802 family of standards dealing with local and metropolitan area

networks.

Finally, the concept of de facto standards, exemplifying ICT-related items such as PDF, HTML, and Microsoft Windows is introduced. De facto standards are described as common practices adopted by the market without undergoing a formal standardisation process. These standards, created by public acceptance or market forces, hold dominant positions and may be formally adopted later. A de facto standard is defined as a custom or convention that achieves dominance through public acceptance or market forces, often validated by market processes. The concept of a "dominant design" is introduced, emphasising key features that may arise due to technological path-dependence rather than strict customer preferences.

De facto standards may eventually be adopted as formal standards by recognised SDOs, citing examples like ISO/IEC 15445:2000 for HTML and ISO 32000-1:2008 for PDF. A comparison between SDO standards and de facto standards is provided, highlighting differences in development processes, decision-making, and participation rules.

Additionally, industrial consortia are introduced as standard setting organisations, citing examples like the Home Gateway Initiative (HGI) and the EnOcean Alliance. Consortia, created for specific purposes, benefit from a lighter process and lower consensus requirements compared to SDO standards, particularly advantageous in the rapidly evolving ICT context. However, documents developed by a single company, like Microsoft's Windows, do not fall into the category of consortia-developed standards.

4 ICT Standardisation Landscape

This section presents the classification of Standard Development Organisations (SDOs) based on various factors. SDOs may differ in geographical coverage, technical scope, and level of recognition from regulatory or political organisations. The landscape includes international SDOs, with global memberships, and regional SDOs, involving countries interested in common practices and regulations.

Examples of international SDOs are provided, such as ITU, ISO, IEC, IETF, ETSI, ARSO, and PASC, each with distinct focuses and memberships. The section also introduces National Standard Bodies (NSBs), operating at the country level and collaborating with international and regional SDOs.

The technical scope of activities for various SDOs is outlined, covering areas like interoperable telecom specifications, ICT architecture, electrotechnical standards, household appliances, intelligent transportation, and more.

Additionally, examples of liaisons among SDOs are presented, highlighting collaborative efforts in the ICT ecosystem. Recognised SDOs, officially acknowledged by regulation systems or political bodies, are contrasted with non-recognised organisations, with IEEE being cited as a significant SDO not officially recognised but contributing to various technical standards. Furthermore, it is shown that SDOs can create groups/projects, like 3GPP and OneM2M, for specific standardisation purposes, involving cooperation in defining standards in telecommunications and machine-to-machine services, respectively.

Finally, the section mentions organisations, such as Industrial Fora/Consortia, which may not strictly follow formal standardisation procedures but aim to define standards in specific areas through collaborative efforts.

5 Linkages between standard development organisation

The last section explores the geographical scope, cooperation, coordination, and interlinkages among different Standard Development Organisations (SDOs). First, the geographical scope of organisations and standards is presented, highlighting recognised SDOs with national, regional, or international reach. Examples include ISO, IEC, ITU (international), CEN, CENELEC, ETSI (European), PASC (regional in the Pacific area), and DIN, UNE, ANSI, BIS (national in Germany, Spain, USA, and India, respectively). The section introduces standardisation structures at the national, regional, and international levels.

Then, practice of standardisation, emphasising that it may not strictly align with geographical structures, are presented. Examples are provided, such as ETSI publishing globally adopted standards like the GSM family, and PASC supporting the region's SDOs in ISO and IEC activities.

Cooperation and coordination among SDOs are discussed, emphasising the objective of optimising resources, supporting information exchange, increasing transparency, and avoiding unnecessary duplication. The priority of international standardisation over regional and national efforts is highlighted.

The role of National Standard Bodies (NSOs) in representing their countries' standardisation activities internationally is explained. The coordination process in Europe, including "standstill" obligations and the adoption of international standards as national standards, is outlined.

Cooperation and coordination agreements between European and international SDOs are mentioned, and specific agreements like the Vienna Agreement between ISO and CEN and the Frankfurt Agreement between IEC and CENELEC are detailed. These agreements streamline collaboration and adoption processes, contributing to harmonised standards.

Additional guidance for regional/national adoption of international standards is provided, referencing ISO/IEC Guide 21. Examples of coordination and cooperation include ISO and IEC forming ISO/IEC JTC 1, and ITU and ETSI establishing a Memorandum of Understanding (MoU).

The webinar concludes with examples of international coordination, featuring the 3rd Generation Partnership Project (3GPP). 3GPP involves organisational members from different continents, providing a stable environment for developing reports and specifications on mobile communication technologies. The process of adopting a 3GPP specification by ETSI is outlined, showcasing how international standards can be adopted and published at regional levels.

BIBLIOGRAPHY

Accompanying textbook:

ETSI (2021). Understanding ICT Standardization: Principles and Practice, Available at:
www.etsi.org/standardization-education

Further references:

Biddle & al. (2010). How many standards in a Laptop? (and other empirical questions),
<http://ssrn.com/abstract=1619440>

CEN-CENELEC (2023). Smart Grids and Meters,
<https://www.cencenelec.eu/areas-of-work/cen-cenelec-topics/smart-grids-and-meters/smart-grids/>
Accessed December 2023.

ETSI (2020). A Guide to Writing World Class Standards,
https://portal.etsi.org/LinkClick.aspx?fileticket=N_gN9ctXowg%3D&tabid=1408&portalid=0.
Accessed December 2023.

ETSI (2023). ETSI Drafting Rules (EDRs).
<https://portal.etsi.org/Services/editHelp/How-to-start/ETSI-Drafting-Rules>.
Accessed December 2023.

ETSI (2023). Standards making process,
<https://portal.etsi.org/Resources/StandardsMakingProcess/Process.aspx>. Accessed December 2023.

ETSI (2023). Different types of ETSI Standards, <http://www.etsi.org/standards/different-types-of-etsi-standards>. Accessed December 2023.

ETSI (2023). ETSI directives, <https://portal.etsi.org/Resources/ETSIDirectives.aspx>. Accessed December 2023.

Fishman, G. (2012). Decision-Making and Approval Procedures: soft and hard decisions,
https://www.itu.int/en/ITU-T/tutorials/Documents/201210/Session-06-Rapporteur%20Tutorial%201208G-Decision_Making.pdf

IETF (2023) IETF Internet Standards web page, <https://www.ietf.org/standards/>. Accessed December 2023.

IETF (2012). The Tao of IETF: a Novice's Guide to the Internet Engineering Task Force,
<https://www6.ietf.org/tao.html>. Accessed December 2023.

IETF (2023). IETF - Mission and Principle, <https://www.ietf.org/about/mission/>. Accessed December 2023.

ISO (2016). How to write Standards, <https://www.iso.org/iso/how-to-write-standards.pdf>. Accessed December 2023.

ITU-T. ITU Standards approval, <https://www.itu.int/en/ITU-T/about/Pages/approval.aspx>. Accessed December 2023.

ITU-T. ITU Standards development, <https://www.itu.int/en/ITU-T/about/Pages/development.aspx>.
Accessed December 2023.

ITU-T (2006). ITU-T Recommendation web page, <https://www.itu.int/rec/T-REC/en>. Accessed December 2023.

ITU-T (2012). Resolution 40 – Regulatory aspects of the work of the ITU Telecommunication Standardization

Sector, https://www.itu.int/dms_pub/itu-t/opb/res/T-RES-T.40-2012-PDF-E.pdf. Accessed December 2023.

ITU-T (2023). Editing Guidelines, <https://www.itu.int/oth/TOA0F000004/en>. Accessed December 2023.



standICT.eu 2026

ICT Standardisation Observatory and Support Facility In Europe

FOLLOW US

Website:
standict.eu

LinkedIn:
[/company/standict-eu/](https://www.linkedin.com/company/standict-eu/)

X:
[@Stand_ICT](https://twitter.com/Stand_ICT)



Funded by
the European Union