HSbooster.eu
TRAINING ACADEMY

Beginner 1

Course 2

STANDARDISATION TRAINING ACADEMY

Topic:

WHAT IS STANDARDISATION, AND WHAT ARE STANDARDS?

25 March

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Funded by the European Union

Module Objectives

After completing this module, you should be able to:

1. understand the basic meaning of standards and standardisation;
2. explain how and why consensus has a different meaning in standardisation;
3. explain why standardisation can be called “the habit-forming process of the industry”; and
4. understand that, based on different points of view, a standard can be defined as a document (for standard makers) or solution (for standard takers).

Key Terms

consensus, matching problem, standard, standardisation

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Ivana Mijatovic is a full professor at the University of Belgrade, Faculty of Organisational Sciences. She has focused on standardisation and quality management for much of her academic career. She has developed standardisation courses at bachelor and master levels and is a passionate teacher of standardisation and ICT standardisation. She served as a vice president on the board of the European Academy for Standardisation EURAS (www.euras.org). In 2018/2019, she was the Chair of the International Cooperation for Education Board about Standardisation ICES (http://www.standards-education.org/). In 2017/2019, she was a member of a working group related to the EU Joint Initiative on Standardisation (JIS Action 3). Since 2015, she has been a member of the STARTed team (Team of Specialists on Standardisation and Regulatory Techniques – education on standardisation) of The United Nations Economic Commission for Europe (UNECE). She is a member of the national mirror committee KS I1/07 – Software Engineering, IT for Education and Internet, at the Institute for Standardisation of Serbia. The list of her publications can be found at the following link: https://www.researchgate.net/profile/Ivana_Mijatovic.

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1 INTRODUCTION

Modern life is not possible without standards that are present all around us. You can plug all the electrical products you buy into the same socket, and each TV will receive a signal from the local broadcaster. To replace tyres on a car, you only need to know the marks - all manufacturers produce tyres following the dimensions and marking standards.[1] At the same time, on the market of products manufactured in accordance with the standards, it is possible to find many products of different quality, classes or types. Product standards do not define all product characteristics but only some important for functioning, safety, or interoperability.

You must have heard of DVD, Wi-Fi or Bluetooth. What do they have in common? Mostly nothing, except that the DVD Forum, the Wi-Fi Alliance, and the Bluetooth SIG (Bluetooth Special Interest Group) are standardisation organisations. Imagine how good it would be if every cartridge fit every printer, regardless of manufacturer, just like you can buy printing paper from any manufacturer. There are plenty of varieties in their quality, but they are all in the same format. All of them are in A4 format, which, like other A and B formats, was first defined by the DIN 476 standard, published in 1922. Welcome to the world of standardisation, where much work is still to be done.

2 WHAT IS STANDARD?

A standard, in any form and type, represents a claim by its authors, who believe the market will understand, accept, and apply their work. That opinion assumes the market will function in its best interest.[2] "A standard can be defined as a construct created by a meaningful, reasonable, and collective choice that enables agreement regarding the solution of existing problems".

Generally, and highly simplified, the story goes like this. Some actor(s) (e.g., companies, alliances of companies & organisations, research institutes, universities, and many other types of organisations) have a problem and need, for many different reasons, to find a solution with others. Some organisations – let's call them organisations for standardisation – provide a place and a specific framework (e.g. rules, process, project management) for actors to develop a joint solution. A company can create a joint solution by directly inviting other companies; this standardisation is often called standardisation based on cooperation. More about this case can be found in the module on company standardisation. Sometimes, actors create their own alliances in specific sectors and act according to their own rules. That case will be explained in the module on consortia-based standardisation.

[1] To learn more about The European Tyre and Rim Technical Organisation (ETRTO), please visit the following link: https://www.etrto.org/getattachment/About-us/History/ETRTO-MORE-THAN-50-YEARS-OF-STANDARDISATION-2015-03-25.pdf?lang=en-US.

[2] Cargill C.F. (2011). Why Standardization Efforts Fail, Journal of Electronic Publishing, 14(1).

Some standardisation organisations provide a place for agreeing on solutions based on a consensus of many actors and are open to all actors interested in a solution. In those organisations, participation in standards development is voluntary, and the use of standards is voluntary. Due to their way of work and following principles of transparency, openness, impartiality and consensus, effectiveness and relevance, coherence, and the development dimension, [3] those organisations are often called voluntary consensus-based organisations for standardisation.

All standardisation activities begin when some actor(s) propose a solution to others. Then, through the process, they come to a solution that is acceptable to everyone. Standards are not necessarily an expression of the highest expertise or requirements but rather an expression of what the parties involved could agree upon". [4] That is why it is often said that standards do not contain the best practices or solutions for every participating actor but rather those with the highest degree of agreement possible at that moment.

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The Project: SINGLE

SINGLE expands on the technology already demonstrated in Clark et al., "Single-step hydrogen production from NH3, CH4, and biogas in stacked proton ceramic reactors". The key technology component of PCER is the electrochemical cell, which is engineered to act as a durable ADH catalyst and a voltage-driven membrane for hydrogen separation and compression. Realising the four process steps in a single reactor allows the technology to achieve unprecedented energy efficiencies and deliver high-purity pressurised hydrogen directly. SINGLE will demonstrate the technology at a 10 kg H2 /day scale and provide a pathway for future scaleup systems ranging from small (fuelling stations) to large centralised (at harbour) deployments.

The Project Standardisation Needs

SINGLE is a pioneering project that explores ammonia's role within the hydrogen value chain, addressing its potential as a carrier in clean energy systems. As a highly experimental initiative, SINGLE required guidance on navigating the complex and evolving standardisation landscape for hydrogen and ammonia technologies. The project aimed to establish a strategic approach to standardisation, ensuring its outcomes could inform and align with emerging standards. Specific objectives included identifying relevant standards for ammonia and hydrogen, mapping the EU legislative framework, and engaging with key technical committees such as ISO/TC 197 (Hydrogen Technologies) and CEN/CLC/JTC 6 (Hydrogen in Energy Systems). SINGLE also sought support to collaborate with other experimental projects, leveraging lessons learned to refine its approach and contribute to new or revised standards. SINGLE was advised to engage with ISO/TC

[3] To learn more about the World Trade Organisation Technical Barriers to Trade (WTO TBT) Committee's Six Principles for the development of international standards, please visit the following link: https://www.wto.org/english/tratop_e/tbt_e/principles_standards_tbt_e.htm

[4] Madelung, N., & Andersen, K. B. (2013). An Introduction to Formal Standardisation and the Work on ICT Standardisation in ISO/IEC – JTC1 Journal of ICT Standardisation, Vol. 1, 1–24, https://doi.org/10.13052/jicts2245-800X.121.

197 and CEN/CLC/JTC 6 and propose new standards related to ammonia as part of the hydrogen value chain.

To learn more about the Project, please visit the following links:

https://singleh2.eu/

https://zenodo.org/records/14380497

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The Project: COGITO

COGITO introduces a real-time digital twin of a construction project, using methods to ensure interoperability among the different components and technologies constituting the Digital Twin ecosystem, following the lean construction principles. COGITO is a project funded under the European Union's Horizon 2020 Research and Innovation Programme. It aims to materialise the digitalisation benefits for the construction industry by harmonising Digital Twins with the Building Information Model concept and to establish a digital Construction 4.0 tool-box. COGITO targets a semantic and pragmatic alignment between novel data capture techniques and delivery of value-adding end-user services leveraging the power of near-real-time data for the timely detection of health and safety hazards to humans, construction quality defects as well as a constantly up-to-date workflow management in order to minimise construction project time/cost overruns and alleviate workplace accidents.

The Project Standardisation Needs

COGITO project focuses on advancing standardisation in construction, data modelling, and linked open data. It plans to engage with key industry bodies to gather feedback and garner interest in its standardisation initiatives. Consortium partners have been active in standardisation activities and contributed to the EUOS Landscape of Digital Twin Standards. They also submitted a use case for the upcoming ISO/IEC 30172 standardisation effort. COGITO sought HSbooster.eu open call support to elevate its standardisation efforts, aiming to submit results to at least four standards. With HSBooster support, COGITO identified and prioritised standardisation proposals to present at various standardisation committees active in the construction industry.

To learn more about the Project, please visit the following links:

https://cogito-project.eu/

https://zenodo.org/records/14509688

However, the story is more complicated and much more interesting in reality. Without standards, world trade will be impossible because ''standards control access to virtually every market in global commerce

and directly affect more than eighty per cent of world trade". [5] There are many active standards organisations [6] with thousands of members who develop tens of thousands of standards every year that interact with the innovative decisions of most manufacturers. [7]

Many standards organisations develop standards and have their own definitions of standards. It is essential to understand that no general or global standardisation regulation exists. No organisation globally recognises another organisation for standardisation as selected or competent to be called the organisation for standardisation. In such an environment, finding the right point of view might be challenging when trying to make standards and standardisation closer to beginners. We decided to introduce two points of view – one of the voluntary consensus-based organisations for standardisation and academic or general ones that might help understand the basic meanings of standards and standardisation.

3 HOW DO VOLUNTARY CONSENSUS-BASED ORGANISATIONS FOR STANDARDISATION DEFINE STANDARDS AND STANDARDISATION?

Voluntary consensus-based organisations for standardisation are organisations that develop and maintain standards in the so-called open process of development. This means that participation in the organisations is voluntary, and the process of standards development is open. The users of their standards use them voluntarily. Voluntary consensus-based organisations for standardisation are often called formal organisations for standardisation. Standards developed in formal organisations for standardisation are often called formal standards.

Formal organisations for standardisation define standards and standardisation differently. The ISO and IEC define standardisation as "the activity of establishing, with regard to actual or potential problems, provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context". [8] The activity consists of "the process of formulating, issuing, and implementing standards". [9] CEN and CENELEC define a standard as "a technical document designed to be used as a rule, guideline, or definition – it is a consensus-built, repeatable way of doing something. Standards are created by bringing together all interested parties, such as manufacturers, consumers, and regulators of a particular material,

[5] Purcell, D. & Kushnier, G. (2016). Globalization and Standardisation. The Journal of SES – The Society for Standards Professionals. Accessed on 09.11.2022. Retrieved from: http://www.standardsuniversity.org/e-magazine/august-2016-volume-6/globalization-and-standardisation/.

[6] According to consortiuminfo.org, there are currently more than 1120 active standards organisations, see the list at the following link: https://www.consortiuminfo.org.

[7] Baron, J., & Spulber, D. F. (2018). Technology Standards and Standard Setting Organizations: Introduction to the Searle Center Database. Journal of Economics and Management Strategy, 27(3), 462–503, https://doi.org/10.1111/jems.12257.

[8] ISO/IEC. (2004). ISO/IEC Guide 2:2004, Standardization and related activities – General vocabulary. Accessed on 25.02.2025. Retrieved from: https://www.iso.org/standard/39976.html.

[9] Ibid.

product, process, or service" [10]. ETSI defines a standard as "a document that provides rules or guidelines to achieve the optimum degree of order in a given context". [11]

Although formal organisations for standardisation globally use different definitions for different purposes (e.g., for clarification, promotion, education, etc.), they often use definitions of ISO and IEC as common. According to ISO and IEC, a standard is: "a document, established by consensus, and approved by a recognised body, that provides, for common and repeated use, rules, guidelines, and characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context" [12] A note often accompanies this definition that standards should be based on the consolidated results of science, technology, and experience and aimed at promoting optimum community benefits. [13]

Consensus (*Latin cōnsēnsus*) means agreement, accordance, and unanimity. In standardisation, a consensus has a slightly different meaning. According to the ISO/IEC, a consensus is "a general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments".[14] This definition is accompanied by a note that "consensus need not imply unanimity". [15] How come that is? At the beginning of formal standardisation, one of the basic principles was reaching unanimity in decision-making or consensus. Since the mid-1980s, formal organisations for standardisation have faced the need to adopt standards faster because achieving consensus was usually time-consuming, leading to the case that newly published standards were obsolete. That's why consensus in standardisation has a slightly different meaning. In other words, in standardisation, consensus means "agreeing not to disagree any longer". [16]

4 THE NEED FOR A GENERAL DEFINITION OF STANDARDISATION

Not all standards are consensus-based or approved by a recognised body, and not all standards are in the form of a document (e.g., it might have a form of code). [17] De facto standards are developed outside formal organisations for standardisation and the government. In general, informal organisations for standardisation can be professional or industrial associations, business associations, consortia, and fora that develop de facto standards.

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[10] CEN/CENELEC. (2025). European Standards. Accessed on 25.02.2025. Retrieved from: https://www.cencenelec.eu/european-standardization/european-standards/.
[11] ETSI. (2025). Types of Standards. Accessed on 25.02.2025. Retrieved from: https://www.etsi.org/standards/types-of-standards.
[12] ISO/IEC. (2004). ISO/IEC Guide 2:2004, Standardization and related activities – General vocabulary. Accessed on 25.02.2025. Retrieved from: https://www.iso.org/standard/39976.html.
[13] Ibid.
[14] Ibid.
[15] Ibid.
[16] De Vries, H. (2006). Fundamentals of Standards and Standardisation. In W. Hesser, Feilzer, & H. De Vries (Eds.), Standardisation in Companies and Markets. Helmut Schmidt University, Hamburg, pp. 1–33.
[17] Ibid.

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The Project: INFITECH and FAME

INFINITECH is a joint effort of global leaders in ICT and finance towards lowering the barriers to BigData / IoT/ AI driven innovation, boosting regulatory compliance and stimulating additional investments. INFINITECH has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement nº 856632. Its successor project, FAME, is a joint effort of world-class experts in data management, data technologies, the data economy, and digital finance. The FAME project has received funding from the European Union's Horizon 2023 Research and Innovation Programme under grant agreement nª 101092639.

The Project Standardisation Needs

INFINITECH and its successor project, FAME, recognised the importance of standardisation to ensure interoperability, security, and scalability within financial and insurance technologies. INFINITECH, focusing on areas such as blockchain, privacy, and AI-powered solutions, required support to validate its progress and align its innovations with existing standards. As the project was in its later stages, it was necessary to identify relevant standardisation opportunities and effectively communicate results to technical committees and stakeholders. FAME expanded upon INFINITECH's achievements, aiming to establish a federated, secure, and energy-efficient data marketplace for embedded finance. This involved leveraging lessons from INFINITECH, such as its blockchain infrastructure while introducing new features like DataOps and MLOps solutions. Standardisation support was needed to align these innovations with key standards in Artificial Intelligence, Decentralised Identifiers and Verifiable Credentials. INFINITECH and FAME advanced blockchain-related de-facto standardisation activities, showcasing the application of distributed ledger technologies in various sectors.

To learn more about the Project, please visit the following links:

https://marketplace.infinitech-h2020.eu/

https://www.fame-horizon.eu/the-project/

https://zenodo.org/records/14380498

Throughout the definitions of formal organisations, the significance of formal organisations for standardisation is emphasised by mentioning the consensus and the approval by the recognised body. Contrarily, definitions of informal organisations for standardisation are pretty specific and reflect the purpose and objectives of industrial or sectoral standardisation. In many cases, they do not mention the approval or consensus.

Many professional and industrial associations and consortia follow the same principles as formal organisations (e.g., voluntary and consensus-based processes, transparency, and openness). Some business associations, consortia, and fora have different approaches and principles. For example, W3C promotes consensus, fairness, public accountability, and quality, while some consortia, fora, or global companies

develop standards through a closed process to the public. This suggests that there is a need to create a comprehensive definition of standardisation that aims to encompass its various aspects.

At the beginning of modern standardisation, the dominant approach was that standards contain solutions that have already been verified in practice or represent good practice. Standards were usually based on "consolidated results of science, technology, and experience" [18], and might be described as "an agreed-upon way of doing something". [19] The primary purpose of standardisation was rationalisation by reducing the variety of products and services on the market. In a situation where there were several known and already available solutions to a problem, standardisation implied the selection of one or a definite number of the existing solutions.

One of the first general definitions of the term standard was developed by Gaillard "a standard is a formulation established verbally, in writing or by any other graphical method, or through a model, sample or other physical means of representation, to serve during a certain period for defining, designating or specifying certain features of a unit or basis of measurement, a physical object, [20] an action, a process, a method, a practice, a capacity, a function, a performance, a measure, [21] an arrangement, a condition, a duty, a right, a responsibility, a behaviour, an attitude, a concept, a conception". [22]

This definition addresses several aspects: [23]

- a standard is a formulation, meaning that "in its perfect form, the standard is the result of putting ideas into a clear and definite form of statement or expression",
- a standard serves as a means of defining, designating, or specifying various features of one or more objects and
- a standard serves in this capacity only "**during a certain period**," meaning that the standard's original value and meaning shall evaporate over time.

Why might Gaillard's definition from 1933 still be relevant? This definition indicates the role of standards during the first decades of the 20th century. The industry was looking for specific and practical solutions when there was no generally accepted knowledge or ready-to-use solutions needed by the industry. To enable mass production, it was necessary to harmonise existing practices and find solutions with the highest possible agreement between actors. Gaillard proposed the term "habit formation" to explain the solutions based on "judgment and intuition unconsciously combined with inherited tradition and practical

[18] ISO/IEC. (2004). ISO/IEC Guide 2:2004, Standardization and related activities – General vocabulary. Accessed on 25.02.2025. Retrieved from: https://www.iso.org/standard/39976.html.

[19] Spivak, S., & Brenner, C. (1993). Standardisation Essentials: Principles and Practice (First edition). CRC Press, https://doi.org/https://doi.org/10.1201/9781482277388.

[20] Gaillard explained that this should be understood as ''applying to shapeless objects, such as certain materials, as well as to objects that have a definite shape, such as the products of the mechanical industry''.

[21] Gaillard explained that this should be understood as ''a potential action or condition, such as a measure taken to start production at a certain time or a measure taken to establish a safe condition in a plant, but not in the sense of a unit of measurement''.

[22] Gaillard, J. (1933). A study of the fundamentals of industrial standardisation and its practical application, especially in the mechanical field, pp. 33, Accessed on 25.02.2025. Retrieved from: https://repository.tudelft.nl/record/uuid:eb5dd4a5-6b5a-4af5-ae8a-197de0cfcc78.

[23] Ibid.

experience". [24] This led to the development of one of the first definitions of standardisation: "standardisation is the habit-forming process of the industry". Although standardisation mainly deals with technical issues, in the broadest interpretation, it has a predominantly economic impact. Why do market competitors agree to joint solutions? In many cases, to have a larger market but also greater competition.

However, modern standardisation is not limited to only technical solutions. When Rajagopalachari, the first governor of independent India, said in 1949: "Standards are to the industry what culture is to society," Verman, the father of Indian standardisation, disagreed with reducing the function of standards to the field of technology or industry alone. He argued that it is better to say that technological standards help order society from the point of view of technological needs in the same way that cultural standards order it socially. What can be subject to standardisation? Are there any restrictions? The concept evolved, and modern standardisation is also dealing with social problems. Standard ISO 26000 guides businesses and organisations committed to operating in a socially responsible way. Many standards are related to sustainability and contribute to Sustainable Development Goals**.** [25]

How to define standards and standardisation to fit all different standardisation aspects? According to de Vries, the activity of developing standards may be called standardisation. [26] According to de Vries, standardisation "concerns establishing and recording a limited set of solutions to current or potential matching problems directed at benefits for the party or parties involved and intending and expecting that these solutions will be repeatedly or continuously used during a certain period by a substantial number of the parties for whom they are meant". [27] According to de Vries, a standard is "an approved specification of a limited set of solutions to actual or potential matching problems, prepared for the benefits of the party or parties involved, balancing their needs, and intended and expected to be used repeatedly or continuously, during a certain period, by a substantial number of the parties for whom they are meant". [28]

These definitions address several fundamental aspects: [29]

- A matching problem is "a problem of interrelated entities that do not harmonise with each other; solving it means determining one or more features of entities in such a way that they harmonise with one other or determining one or more features of an entity because of its relationship with other entities".
- An entity should be understood as "any concrete or abstract thing that exists did exist, or might exist, including associations among these things".
- In some cases, standards (especially standards developed by some business associations or consortia) might serve the interests of only one party. Standards development must be based on

[24] Ibid.
[25] To learn more about the CEN/CENELEC journey towards the UN Sustainable Development Goals (SDGs), please visit the following link: https://www.cencenelec.eu/european-standardization/sustainable-development-goals-sdgs/.
[26] De Vries, H. J. (1999). Standardisation: A Business Approach to the Role of National Standardisation Organizations. Springer New York, NY Springer-Verlag US 1999, 1st Edition, https://doi.org/10.1007/978-1-4757-3042-5, pp. 33.
[27] Ibid.
[28] Ibid.
[29] Ibid.

the interests of one or more parties involved; the interests of one or more of these parties are often conflicted, and the parties must find a solution that might be acceptable to everyone involved. A balance of needs can also mean that the interests or needs of one party are never completely satisfied.

SUMMARY

Although formal organisations for standardisation use different definitions for different purposes (e.g. for clarification, promotion, education, etc.) they often use one common definition. For most formal organisations for standardisation, a standard is: "a document, established by consensus, and approved by a recognised body, that provides, for common and repeated use, rules, guidelines, and characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context". [30] Consensus is "a general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments". [31] In practice, consensus means "agreeing not to disagree any longer". [32]

One of the first general definitions of standardisation is "standardisation is the habit-forming process of the industry". [33] Standardisation "concerns establishing and recording a limited set of solutions to current or potential matching problems directed at benefits for the party or parties involved and intending and expecting that these solutions will be repeatedly or continuously used during a certain period by a substantial number of the parties for whom they are meant". [34] Standard is "an approved specification of a limited set of solutions to actual or potential matching problems, prepared for the benefits of the party or parties involved, balancing their needs, and intended and expected to be used repeatedly or continuously, during a certain period, by a substantial number of the parties for whom they are meant". [35]

[30] ISO/IEC. (2004). ISO/IEC Guide 2:2004, Standardization and related activities – General vocabulary. Accessed on 25.02.2025. Retrieved from: https://www.iso.org/standard/39976.html.
[31] Ibid.
[32] De Vries, H. (2006). Fundamentals of Standards and Standardisation. In W. Hesser, Feilzer, & H. De Vries (Eds.), Standardisation in Companies and Markets. Helmut Schmidt University, Hamburg, pp. 1–33.
[33] Gaillard, J. (1933). A study of the fundamentals of industrial standardisation and its practical application, especially in the mechanical field, pp. 33, Accessed on 25.02.2025. Retrieved from: https://repository.tudelft.nl/record/uuid:eb5dd4a5-6b5a-4af5-ae8a-197de0cfcc78.
[34] De Vries, H. J. (1999). Standardisation: A Business Approach to the Role of National Standardisation Organizations. Springer New York, NY Springer-Verlag US 1999, 1st Edition, https://doi.org/10.1007/978-1-4757-3042-5, pp. 33.
[35] Ibid.

GLOSSARY

consensus

"a general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments". [36] This definition is accompanied by a note that "consensus need not imply unanimity". [37] In other words, consensus means "agreeing not to disagree any longer". [38]

matching problem

"a problem of interrelated entities that do not harmonise with each other; solving it means determining one or more features of entities in such a way that they harmonise with one other or determining one or more features of an entity because of its relationship with other entities". [39]

standard

"an approved specification of a limited set of solutions to actual or potential matching problems, prepared for the benefits of the party or parties involved, balancing their needs, and intended and expected to be used repeatedly or continuously, during a certain period, by a substantial number of the parties for whom they are meant". [40]

standardisation

"concerns establishing and recording a limited set of solutions to current or potential matching problems directed at benefits for the party or parties involved and intending and expecting that these solutions will be repeatedly or continuously used during a certain period by a substantial number of the parties for whom they are meant". [41]

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[36] ISO/IEC. (2004). ISO/IEC Guide 2:2004, Standardization and related activities – General vocabulary. Accessed on 25.02.2025. Retrieved from: https://www.iso.org/standard/39976.html.
[37] Ibid.
[38] De Vries, H. (2006). Fundamentals of Standards and Standardisation. In W. Hesser, Feilzer, & H. De Vries (Eds.), Standardisation in Companies and Markets. Helmut Schmidt University, Hamburg, pp. 1–33.
[39] De Vries, H. J. (1999). Standardisation: A Business Approach to the Role of National Standardisation Organizations. Springer New York, NY Springer-Verlag US 1999, 1st Edition, https://doi.org/10.1007/978-1-4757-3042-5, pp. 33.
[40] Ibid.
[41] Ibid.

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