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TRAINING ACADEMY

Beginner 1

Course 6

STANDARDISATION TRAINING ACADEMY

Topic:

USERS OF STANDARDS

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Module Objectives

After completing this module, you should be able to:

1. understand the significance of direct and indirect standards users;
2. understand the need to represent the voice of standards users in the development of voluntary standards;
3. understand how standards users influence the development of new standards; and
4. understand the concepts of the installed base, lock-in, dominant design, and the bandwagon effect.

Key Terms

bandwagon effect, direct users, dominant design, indirect users, phenomenon ''lock-in''

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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 serves 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 publication can be found at the following link: https://www.researchgate.net/profile/Ivana_Mijatovic.

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1 DIRECT AND INDIRECT USERS OF STANDARDS

Standards directly influence more than 80% of world trade. [1] However, the general public is often unaware of the existence and impact of standards. Generally, there are two types of standard users – direct and indirect. Direct users are standards implementers or organisations and persons that use or apply standards in various activities (e.g. research, design, production, service provision, conformity assessment, etc.). Standards can be used by companies and a wide range of different kinds of organisations, but also by the state administration.

Indirect users are all those affected by the standard's application, e.g. users of standard-compliant products and services. Indirect standards users are primarily consumers or professional users of products, services, processes, or systems to which the standard applies. These can also be interest groups: consumer organisations, trade unions (e.g. in the case of standards concerning occupational safety), environmental organisations, etc. Two aspects related to users of standards are gaining attention: users' participation in standards development and the influence of users on standards development.

Large companies, direct users of standards, participate in standards development significantly more than SMEs, who are direct standards users. [2] In the case of indirect users of standards, SMEs and consumers are the two groups with the lowest involvement in standardisation development (aside from large companies and authorities). According to the EUROSTAT data for 2019, out of 23.2 million enterprises (non-financial businesses) in the EU, only 0.2% are large enterprises (≥ 250 employees), 0.9% are medium-sized enterprises (50 to 249 employees), and 98.9% are micro and small enterprises with less the 49 employees. [3] The cost-benefit ratio of SMEs for participation in standards development processes is much worse than for large enterprises (taking in time required, the expenses of fees, travel, and accommodation), and even the involvement of consumers, environmental groups, and trade unions are low in national standardisation. [4]

There are plenty of reasons why the voice of direct and indirect standards users is vital in standardisation development. One of the reasons might be preventing "the high risk of a standard's failure in the open market if no users were involved in its development". [5] Most voluntary consensus-based Standards Development Organisations (SDOs) defined specific calls for their involvement to provide more space for indirect standards users.

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[1] 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/

[2] Van Eecke,, P. Pinto Fonseca, P., & Egyedi, T. (2007). EU Study on the specific policy needs for ICT standardisation,

[3] EUROSTAT, (2022). Key figures on European business. Accessed on 08.11.2022. Retrieved from: https://ec.europa.eu/eurostat/documents/3217494/14871931/KS-06-22-075-EN-N.pdf/7d3b8dad-a4a3-cced-470f-13a4275c570e?t=1661415796189

[4] Elk, K.V. & Horst, V.D. (2009). Access to Standardisation Study for the European Commission, Enterprise and Industry Directorate-General Final Report. Accessed on 08.11.2022. Retrieved from: https://www.anec.eu/images/Publications/Access-Study---final-report.pdf

[5] Jakobs, K., Procter, R. & Williams, R. (2013). Telecommunication standardisation - do we really need the user? Accessed on 09.11.2022. Retrieved from: https://www.researchgate.net/publication/242368662_Do_We_Really_Need_Users_in_Standards_Setting

Some organisations that represent the voice of standards users are:

- **International Federation of Standards Users (IFAN)**. The IFAN is an independent, non-profit-making international association of national organisations for the application of standards, companies, professional and trade associations, academia, conformity assessment bodies, consultancies, and governmental agencies that are concerned with the use of standards. Organisations whose memberships are concerned with the end use of products and services complying with standards (representatives of indirect standards users) are not members of the IFAN. The IFAN represents the voice of standards users in the ISO/CASCO Committee on conformity assessment, serving as Liaison A. Within the ISO, Liaison A organisations are "organisations that make an effective contribution to the work of the technical committee or subcommittee for questions dealt with by this technical committee or subcommittee". [6] Principles and guidance on stakeholder engagement and consensus decision-making for ISO liaison organisations are given in Section 3 of "Guidance for ISO liaison organisations – Engaging stakeholders and building consensus". [7] The IFAN published guidance for countries interested in creating a national standards users group regarding structure, management, and other considerations. [8] To learn more about the IFAN, please visit the following link: https://www.ifan.org/
- **European Association for the Coordination of Consumer Representation in Standardisation (ANEC)**. The ANEC represents the European consumers' interest in standards development. It is the European consumers' voice in standardisation. The lack of consumers' expertise for large numbers of "items being standardised" at national levels is one of the reasons for the ANEC's establishment in 1995. Members of ANEC are representatives of national consumer organisations from the countries that are members of the CEN and the CENELEC. After a public call, the ANEC is selected again by European Commission (EC) and EFTA Secretariat to serve as a European organisation representing customers in standardisation from 2021 to 2025. In 2021, the ANEC participated in 180 technical committees (TCs) and working groups of the CEN, the CENELEC, and the ETSI and over 25 ISO and the IEC technical committees. [9] To learn more about the ANEC, please visit the following link: https://www.anec.eu/
- **Small Business Standards (SBS).** The SBS is the voice of European SMS in standardisation at the European and international levels. It is a non-profit association co-financed by the European Union and the EFTA Member States. The SBS was established to meet the European Union's aspiration to make the standardisation system as inclusive, transparent, and open as possible (in line with Regulation 1025/2012 on the European Standardisation System). In 2020, 68 SBS experts

[6] ISO. (2013a). Guidance for ISO liaison organisations - Engaging stakeholders and building consensus. Accessed on 09.11.2022. Retrieved from: https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/guidance_liaison-organisations.pdf

[7] ISO. (2013a). Guidance for ISO liaison organisations - Engaging stakeholders and building consensus. Accessed on 09.11.2022. Retrieved from: https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/guidance_liaison-organisations.pdf

[8] IFAN, (2019). Guide 2 Guidance for establishing a National Standards Users Group, Accessed on 09.11.2022. Retrieved from: https://www.ifan.org/IFAN_Guide_2-2019_Version.pdf

[9] ANEC. (2022). Annual Report. Accessed on 09.11.2022. Retrieved from: https://www.anec.eu/images/Publications/annual-reviews/ANEC_AR_2021-Accessible_Pages-1.pdf

participated in the work of 234 technical committees and working groups of CEN, CENELEC, ETSI, ISO, and IEC. [10] The SBS established the online test "SME Compatibility Test for Standards", based on the CEN/CENELEC Guide 17, "Guidance for writing standards taking into account micro, small and medium-sized enterprises (SMEs) needs". [11] To learn more about the SBS, please visit the following link: https://www.sbs-sme.eu/

- **Consumers International.** Consumers International has liaison status with the Consumer Policy Committee of ISO and has the right to propose new work items that can lead to the development of new standards. Over the years, they have supported the development of many standards on subjects such as energy, mobile payments, and corporate social responsibility. They have helped to provide training in the standardisation process. To learn more about Consumers International, please visit the following link: https://www.consumersinternational.org/

2 HOW DO STANDARD USERS INFLUENCE STANDARDISATION?

Standards are developed to be used. The number of users of the solution, which is the basis of the content of one standard (object of standardisation), is called the installed base. In standardisation, the installed base can be a group of users committed to using the standard [12] or simply the number of users of a standard. [13] Look at your computers; there's a good chance you're using a QWERTY keyboard. In that case, you are an indirect standards user – a user of the solution that is called the QWERTY layout. The QWERTY layout is also called the de facto standard. De facto standards are informal and unwritten standards that represent solutions that are in general use. If you try to search for the QWERTY standard, you can come across numerous documents, among others, the ISO/IEC 9995 group of standards, which defines the keyboard layouts for text and office systems. It is an example of how de facto standards can become formal standards.

[10] SBS. (2020). Annual Report. Accessed on 09.11.2022. Retrieved from: https://www.sbs-sme.eu/sites/default/files/publications/SBS%20Annual%20Report%202020_1.pdf

[11] SBS. (2022). SME Compatibility Test for Standards. Accessed on 09.11.2022. Retrieved from: https://www.sbs-sme.eu/sme-compatibility-test-standards-1

[12] Farrell, J. Saloner, G. (1986). Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation, The American Economic Review, Vol. 76, No. 5. (Dec., 1986), pp. 940-955. Accessed on 23.10.2022. Retrieved from: http://links.jstor.org/sici?sici=0002-8282%28198612%2976%3A5%3C940%3AIBACIP%3E2.0.CO%3B2-0

[13] De Vries H. (2007). Fundamentals of Standards and Standardisation, in Hesser W., Feilzer A., de Vries H.,(Eds.), *Standardisation in Companies and Markets*, Helmut Schmidt University Germany, Erasmus University of Rotterdam, Netherlands, pp. 39.

2.1. Case Study: QWERTY Keyboard

The first commercial typewriter was patented by mechanical engineer Christopher Latham Sholes (1819-1890) in 1877. The Remington Arms Company took over the production of the first commercial machine, and sales began in 1873. This typewriter has long been the most important and widely used tool for administrative work. The increasingly pronounced problem was that the vowel keys with the used letters most often broke down due to frequent use. James Densmore proposed a new layout that would slow down typing and prevent excessive damage to keys. [14] Another interpretation is that Densmore's intention was not to slow down typing but to reduce the pressure on the keys by placing the most frequently used keys in pairs at two different ends of the keyboard. The new layout became common and represents today's QWERTY layout (Figure 1). [15]

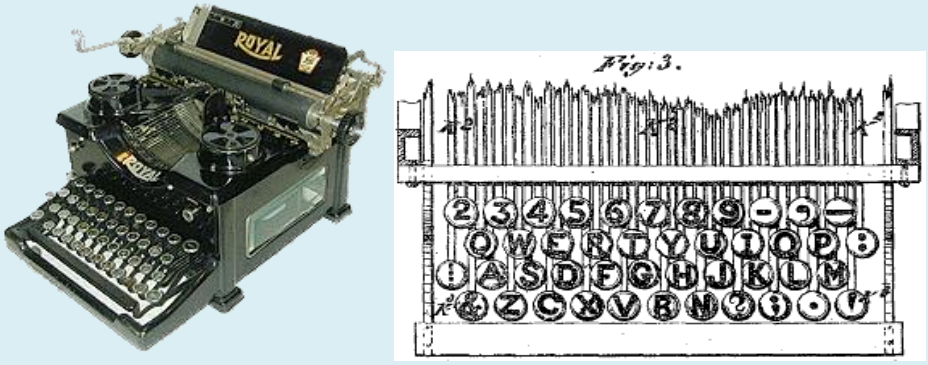

Fig. 1. The first commercial typewriter and display of QWERTY layout [16]

The motives and intentions of James Densmore have long been forgotten, and most computer keyboards in use today are QWERTY. Today QWERTY keyboards are synonyms for those made following standards issued by the ISO, ANSI, and JSI. Numerous standards address various aspects of keyboards. Standards that refer to the position of letters on an electronic keyboard have been developed from the early seventies until today. Today, this area is covered mainly by the ISO/IEC 9995. In it, you can find the QWERTY layout

Why QWERTY when a better solution has long existed? August Dvorak (1894–1975) was a famous American psychologist and professor of educational psychology at the University of Washington. [17] In 1937, Dvorak and his colleagues published a book on typing behaviour. Based on his research, in 1940, Dvorak proposed

[14] Bellis, M. (2011). Typewriters, QWERTY, and Typing. Accessed on 12.04.2011. Retrieved from: https://inventors.about.com/library/inventors/brtypewriter.html/
[15] Bigler J. C. (2014). The Dvorak Keyboard. Accessed on 11.02.2014. Retrieved from: http://www.mit.edu/~jcb/Dvorak/
[16] My Typewriter. (2022). Typewriter History. Accessed on 03.11.2022. Retrieved from: http://mytypewriter.com/explorelearn/index.html
[17] Brooks M. (2011), Introducing the Dvorak Keyboard, Accessed on 08.09.2011. Retrieved from: http://dvorak.mwbrooks.com/

a new simplified layout with several features that contributed to increased typing speed, reduced typing errors, and increased comfort (Figure 2).

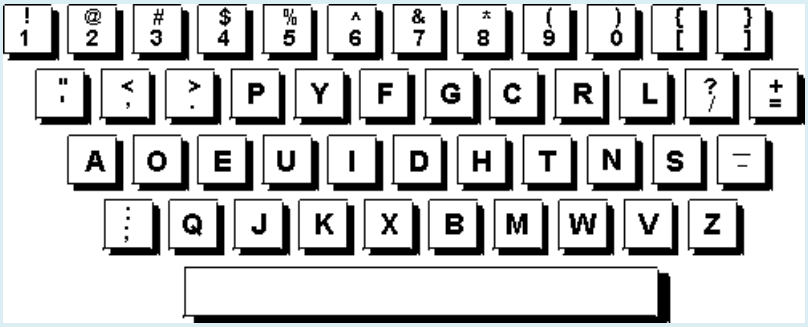

Fig. 2. Dvorak simplified layout [18]

The layout was designed for the English language and allowed 70% of the work to take place in the areas of the keyboard that is most comfortable for the human hand, unlike the QWERTY keyboard, where only 32% takes place in the comfortable zone. [19] Today, it is possible to buy a simplified Dvorak keyboard in specialised computer equipment stores. Most electronic keyboards on computer screens or mobile devices have options that allow the use of the Dvorak layout as well.

2.2. Dominant Design, Phenomena "Lock In", and the Bandwagon Effect

Why was Dvorak's solution not built into our computers? There are plenty of reasons, but one might be that PCs need to replace typing machines and attract an installed base of typing machines with a dominant QWERTY layout. Switching costs – costs of transition to a new solution (e.g. costs of training for the use of Dvorak layout) could have prevented users already using the QWERTY from switching to the new solution and buying PCs. Producers of computers may be worried that the new layout will not be accepted in the market, so they continued with the QUERTY. Why did the QWERTY layout find its place in standards (e.g. ISO, ANSI, JIS) instead of the scientific solution of professor Dvorak? The dominant practice of SDOs before the 1980s was to include in standards only proven solutions (solutions existing on markets) and were reluctant to include innovative solutions in standards. Standards are developed to be used. A successful standard is a standard that is accepted in the market.

Once an installed base is created, users remain loyal to a particular standard even when a solution becomes technologically obsolete or when a new, better solution becomes available. In this case, standard

[18] Vinjones. (2011). The failure to adopt the Dvorak keyboard. Accessed on 11.02.2014. Retrieved from: http://www.vinjones.com/the-failure-to-adopt-the-dvorak-keyboard

[19] Bigler J. C. (2014). The Dvorak Keyboard. Accessed on 11.02.2014. Retrieved from: http://www.mit.edu/~jcb/Dvorak/

conversion (switching to a new, technologically better solution) becomes expensive and time-consuming, and uncertainty about whether consumers on the market will accept the solution becomes the basis for abandoning the new solution. This will lead to the "lock-in" phenomenon – a situation in which obsolete or incumbent technologies prevent the take up of potentially superior alternatives. [20] A large installed base of one solution can also hinder innovation. The consequence of this phenomenon is that standardisation can only be successful if the costs of switching to a new solution are lower than the expected revenues.

A dominant design is one that attracts significant market share and a design that achieves a dominant market position. The market determines what becomes the dominant design. It forces imitative competition design reaction and can trigger the industry to standardise solutions and mass production. [21, 22] The QWERTY layout has established itself as the industry's de facto standard due to its general market acceptance. The QWERTY was included in ISO/IEC 9995 standards as a proven solution (dominant design).

The bandwagon effect [23] in standardisation might be simply explained as a phenomenon that once one standard (or solution) gains a certain installed base, the others tend to use the same standard. Reasons for this phenomenon are: [24, 25]

- availability of the standard (solution) prevent "reinventing the wheel";
- availability of information and experiences related to standards implementation influence acceptance of a standard;
- reducing uncertainty (feasibility of a solution is proven);
- network externalities (defined as benefits or harms that a producer has from a product when the number of users using that solution increases or decreases [26], or "a good is often more valuable to any user, the more others use compatible goods". [27]

[20] Foxon. T. J. (2002). Technological and institutional 'lock-in' as a barrier to sustainable innovation ICCEPT Working Paper. Accessed on 10.02.2002. Retrieved from: https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/icept/7294726.PDF

[21] Murmann, J. P, Frenken, K. (2006). Toward a systematic framework for research on dominant designs,technological innovations, and industrial change, Research Policy 35 (2006) 925–952,

[22] Abernathy, W. J. & Utterback, J. (1978). Patterns of industrial innovation. Technology Review 50, 41–47.

[23] According to Investopedia, ''the bandwagon effect is a psychological phenomenon in which people do something primarily because other people are doing it, regardless of their own beliefs, which they may ignore or override''. See more at https://www.investopedia.com/terms/b/bandwagon-effect.asp

[24] De Vries H. (2007). Fundamentals of Standards and Standardisation, in Hesser W., Feilzer A., de Vries H.,(Eds.), *Standardisation in Companies and Markets*, Helmut Schmidt University Germany, Erasmus University of Rotterdam, Netherlands, pp. 39.

[25] De Vries, H. J. (1999). Standardisation: A Business Approach to the Role of National Standardisation Organisations. Springer Science+Business Media, LLC. https://www.springer.com/gp/book/9780792386384

[26] Liebowitz, S. J., & Margolis, S. E. (2014). Network Externalities (Effects). Accessed on 23.10.2022. Retrieved from: https://personal.utdallas.edu/~liebowit/

[27] Farrell, J. Saloner, G. (1986). Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation, The American Economic Review, Vol. 76, No. 5. (Dec., 1986), pp. 940-955. Accessed on 23.10.2022. Retrieved from: http://links.jstor.org/sici?sici=0002-8282%28198612%2976%3A5%3C940%3AIBACIP%3E2.0.CO%3B2-0

SUMMARY

Standards are developed to be used. A successful standard is a standard that is accepted in the market. Most experts who develop standards represent organisations that implement the same standards. At the same time, the pool of direct standards users (standards implementers) is larger than the pool of standards developers. Understanding standards users might be a changing point in understanding the needs for one standard. However, it is not easy to know who uses specific standards. Formal standardisation organisations do not collect data on who uses the standards, how, and under what conditions they use them. [28]

In general, there are two types of standard users – direct and indirect. Direct users are standards implementers or organisations and persons that use or apply standards in a wide range of their activities. Indirect users are all those who are affected by the application of the standard, e.g. users of standard-compliant products and services. Two aspects related to a user of standards are gaining attention: participation of indirect users in standards development and the influence of indirect standards users on standards use development.

To provide more space for indirect standards users, voluntary standards development organisations (SDOs) have defined specific calls for their involvement. Some organisations that represent the voice of standards users are the International Federation of Standards Users (IFAN), the European Association for the Coordination of Consumer Representation in Standardisation (ANEC), and the Small Business Standards (SBS).

The number of users of the solution, which is the basis of the content of one standard (object of standardisation), is called the installed base. De facto standards are informal and unwritten standards that represent solutions that are in general use. Once an installed base is created, users remain loyal to a particular standard even when a solution becomes technologically obsolete or when a new, better solution becomes available – this is called a “lock-in” phenomenon. A dominant design is one that attracts significant market share and or design that achieves a dominant market position. The market determines what will become the dominant design. Among other, dominant design forces imitative competition design reaction and can trigger the industry to standardised solutions and mass production. The bandwagon effect in standardisation might be explained as a phenomenon in which once one standard (or solution) gains a significant installed base, others tend to use the same standard.

[28] For example, the ISO survey published yearly data on ISO management systems standards certifications. More about this you can find on https://www.iso.org/the-iso-survey.html

GLOSSARY

bandwagon effect

a phenomenon that once one standard (or solution) gains a certain installed base, the others tend to use the same standard

direct users

standards implementers or organisations and persons that use or apply standards in a wide range of their activities

dominant design

a one that attracts significant market share and or design that achieved a dominant market position

indirect users

all those who are affected by the application of the standard e.g. users of standard-compliant products and services

phenomenon ''lock-in''

a situation in which obsolete or incumbent technologies, prevent the take up of potentially superior alternatives. [29] Once an installed base is created, users remain loyal to a particular standard even when a solution becomes technologically obsolete or when a new, better solution becomes available.

[29] Foxon. T. J. (2002). Technological and institutional 'lock-in' as a barrier to sustainable innovation ICCEPT Working Paper. Accessed on 10.02.2002. Retrieved from: https://www.imperial.ac.uk/media/imperial-college/research-centres-and-groups/icept/7294726.PDF

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