EDU4 Standards.eu

EARTO Webinar Series

Standardisation in research and technology for practitioners

Knut Blind, Fraunhofer ISI

Funded by the European Union

Content

- Background: EDU4Standards
- Pilot EARTO

Funded by the European Union

EDU4Standards's structure at a glance

EDU4Standards.eu - Empowering Standardisation through Education in Europe

OBJECTIVES

- **Obj.1**: Develop and disseminate teaching material about standardisation
- **Obj.2**: Increase the visibility via "Academic Standardisation Days" (ASDs)
- **Obj.3**: Increase the number of HEI & universities offering teaching on standardisation
- **Obj.4**: Increase number of teachers offering courses and students attending courses about standardisation
- **Obj.5**: Set up a Students' Standardisation Association (SSA)

Community

- Standardisation Student Association created
- 100+ HEIs exposed to standard education
- 100+ teachers with standardisation knowledge
- 500 students educated in pilots
- 1,500+ engaged community members
- EURAS
- External Advisory Group (EAG)

Innovative Teaching Concept of Standardisation (ITCoS)

Web Platform

Student Standardisation Association & Academic Standardisation Days

EDU4Standards.eu
Empowering Standardisation through Education
ecosystem

Pilots

a. B.Sc course
b. M.Sc course
c. In-company Training
d. Extra-curricular format
e. Seasonal university school
f. Pan-EU EARTO
g. Distance learning

EU & International Synergies

- > 10 Mutual cooperations with National, European, and Int'l organisations and initiatives
- Continuous engagement and exchanges on all ICT standards topics
- Interaction with Policy makers: (Including: EURAS, MSPs, Sherpa Groups of the High-level Standardisation Forum, STAIR, ISO, IEC, ITU & IEEE etc
- Collaborations with HE Standards projects:

HSbooster.eu · StandICT.eu · STAND4EU

Outreach

- 4 Pilot Workshops
- 10 Webinars
- 5 Academic Standardisation Days
- 2 CEN Workshop Agreement Meetings
- 1 Final event
- 12 newsletters
- 3 Press Releases
- 10 Professional Videos
- Visibility at >15 3rd party events
- PPC Campaign
- Social media channels

Reports & other value-add output

- Whitepapers & Scientific Publications
- Online Teaching Content
- CEN Workshop Agreement
- Pilot evaluation reports
- Sustainability strategy
- Policy Recommendations
- EU Standardisation Roadmap
- All Results published via zenodo

SG 1	SG 2	SG 3	SG 4	SG 5	SG 6	SG 7	SG 8	SG 9
HEIs/universities	Teachers & standards educators	Students & Student Associations	Standard Development Organisations	Policy Makers	Environmental and consumer organisations	Research organisations & EU projects	Industry & SMEs	Citizens and citizen groups

Funded by the European Union

Target groups:

- Beginners “Research & Development and Standardisation” course provides a concise yet in-depth understanding of standardisation as relevant from an Research and Technology (RTO) perspective.
- Intermediate experts “Effectively participating in standardisation bodies” course addresses skills to operate in standards bodies.
- Sophisticated experts “Strategic standardization for RTOs” high-level course, aimed at senior researchers, offers a tailored format for standardisation topics for management level also related to RTO’s business models (e.g. IPRs, SEPs, Open Source)

Funded by the European Union

Contents

Webinar series Standardisation in research and technology for practitioners:

- Modul 1: Standardisation Landscape 6.11. 2025
- Modul 2: Types and Impacts of Standards 13.11. 2025
- Modul 3: Research and Standardisation 20.11. 2025
- Modul 4: IPRs and Standardisation 27.11. 2025
- Modul 5: Open Source and Standardisation with Mirko Böhm LF 4.12. 2025
- Modul 6: Geopolitics of Standardisation with Barbara Reiter Uni Graz 11.12. 2025

Funded by the European Union

EDU4 Standards.eu

Module 5 Standardisation and Open Source

Funded by the European Union

Contents

Funded by the European Union

General Information

Accompanying scientific article:

- Mirko Boehm and Davis Eisape. “Standard setting organizations and open source communities: Partners or competitors?” In: *First Monday, Volume 26, Number 7 - 5 July 2021*
  - Available at: https://firstmonday.org/ojs/index.php/fm/article/download/10806/10183

Accompanying research report:

- Knut Blind and Mirko Boehm. “The Relationship Between Open Source Software and Standard Setting” European Commission, Joint Research Centre, 2019
  - Available at: https://op.europa.eu/en/publication-detail/-/publication/6521f427-01df-11ea-8c1f-01aa75ed71a1/language-en

Funded by the European Union

ICT Standardisation and Open Source

- The learning objectives of this webinar are:
  - To **understand** the **difference** between **standardisation** and **open source**
  - To **understand** their interactions from ideation to diffusion
  - To identify their strengths and weaknesses.

Funded by the European Union

Introduction

- Standards as a means to improve overall quality of life through the economies of scale, but also enabler of competition by facilitating interoperability between products of different vendors.
- The wider open source community develops free and open source software (FOSS) that similarly benefits society as a public good.

Funded by the European Union

Introduction

- FOSS and standards setting organisations (SSOs) are both instruments causing standardising effects.
- A mutually beneficial collaboration between them is desirable, but their exact relationship is not fully understood, especially when and how FOSS and SSOs complement each other, or displace each other as competitors.
- A phase model allows to compare the strengths and weaknesses of FOSS and SSOs against common opportunities and threats in the ICT sector.

Funded by the European Union

Open Standards

Funded by the European Union

Possible Definitions

Open Standards

- "An **open standard** is a standard that is openly accessible and usable by anyone. It is also a common prerequisite that open standards use an open license that provides for extensibility. Typically, anybody can participate in their development due to their inherently open nature. There is no single definition, and interpretations vary with usage."

  Source: "Open standard", Wikipedia

- "'Open Standards' are standards made available to the general public and are developed (or approved) and maintained via a collaborative and consensus driven process. 'Open Standards' facilitate interoperability and data exchange among different products or services and are intended for widespread adoption."

  Source: "Definition of 'Open Standards"', ITU

Funded by the European Union

- Open Standards need to allow implementations to guarantee the “Four Freedoms”.
- Implies royalty free, no negotiations, no restrictions on redistribution.
- Openness applies to the standard and the process (again).

Standards and standards-essential patents (SEP)

Open Standards

- Implementations of standards may require patent licenses,(e.g. Blind et al. 2022) common options:
  - Royalty free
  - RAND: “Reasonable and non-discriminatory terms”
  - FRAND: “Fair, reasonable, and non-discriminatory terms”

- RAND/FRAND not well defined, may or may not guarantee “Four Freedoms”.

Funded by the European Union

FOSS and Standards

Funded by the European Union

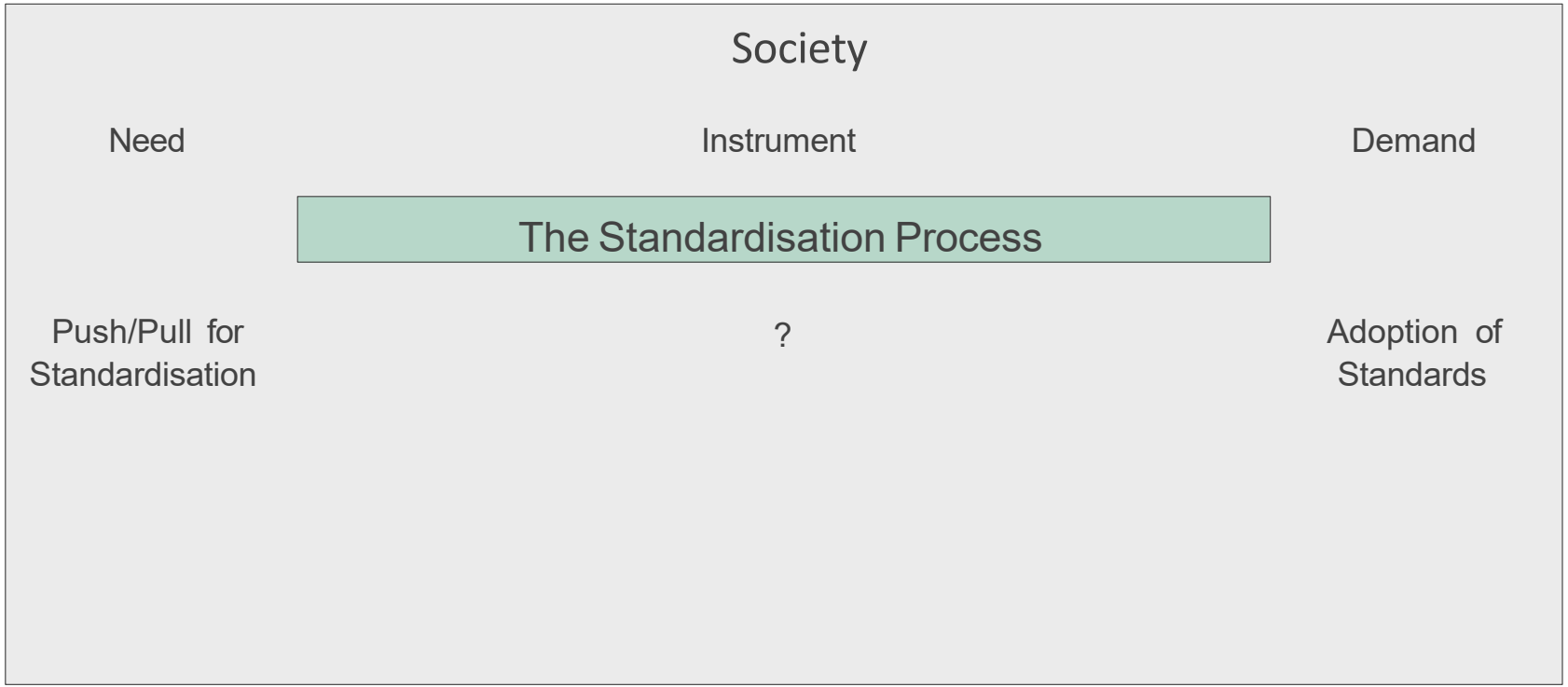
- Integration between open source projects and standards development processes is a win-win situation: on one side the alignment of open source and standardisation can speed-up the standards development process and the take-up of ICT standards (especially for SMEs) and on the other side standards can provide for interoperability of open source software implementations.

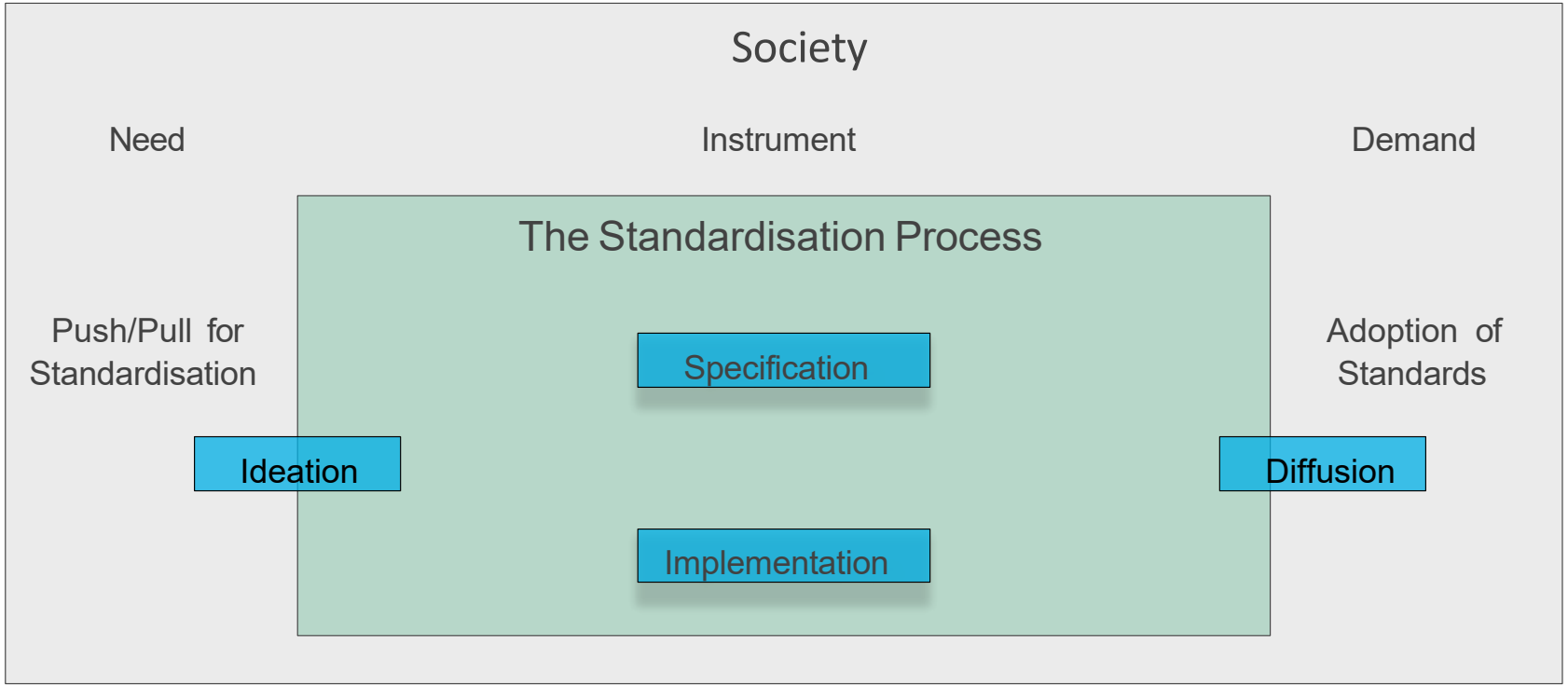
Source: “European Commission. Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee: Setting out the EU approach to Standard Essential Patents. Publications Oce of the European Union, Nov. 2017.

An antiquated view of “standard”

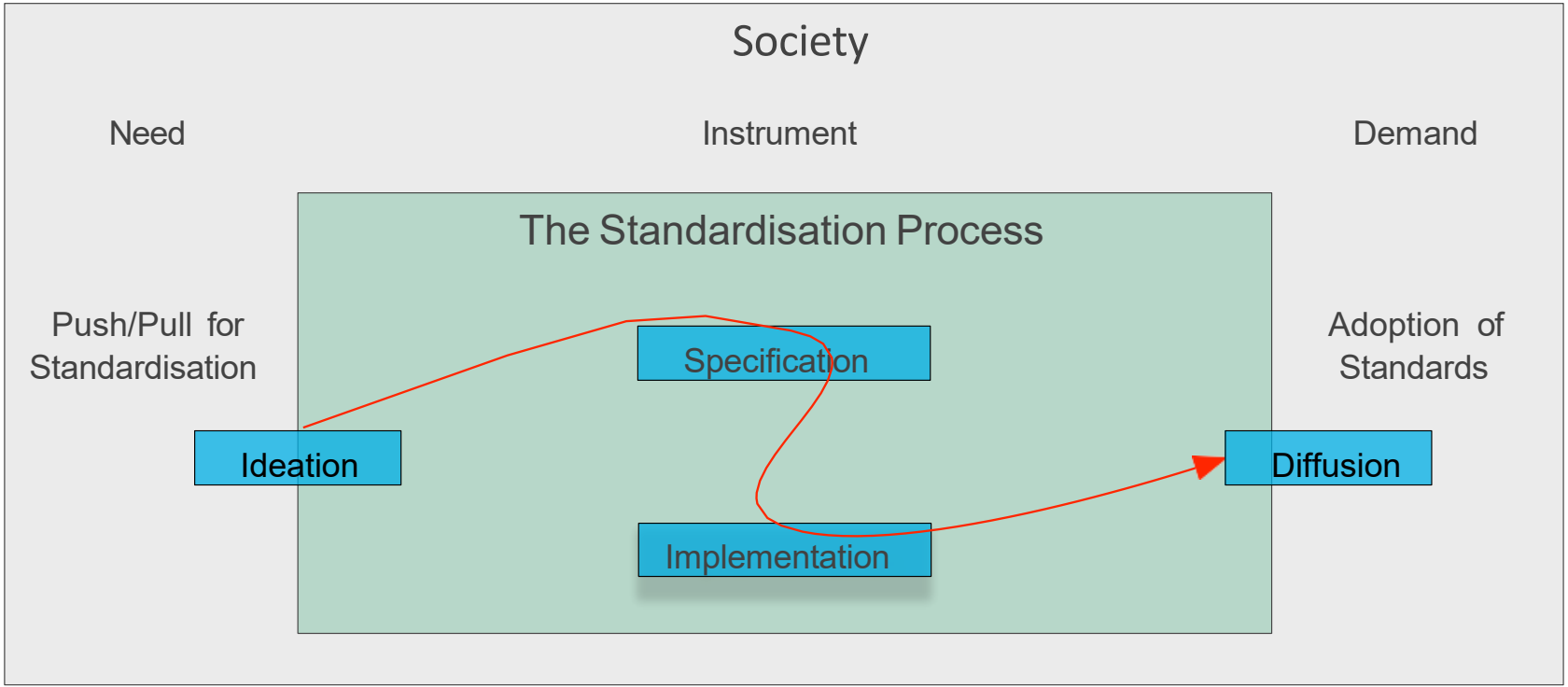
- A standard is “a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.” - ISO/IEC Guide 2:2004
- aka: A standard is what SSOs produce
- Does not explain how FOSS communities achieve standardisation

Funded by the European Union

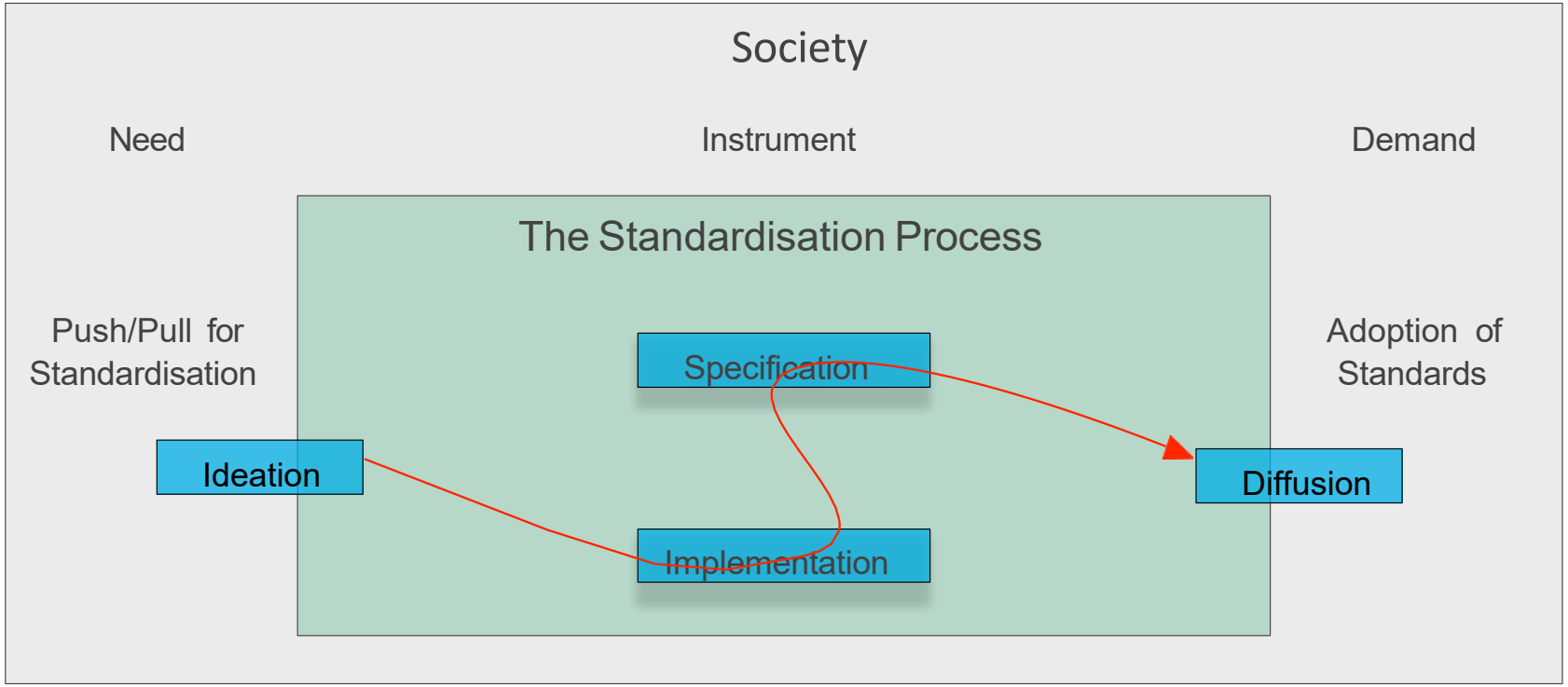

Society
Need
Instrument
Demand
The Standardisation Process
Push/Pull for Standardisation
?
Adoption of Standards



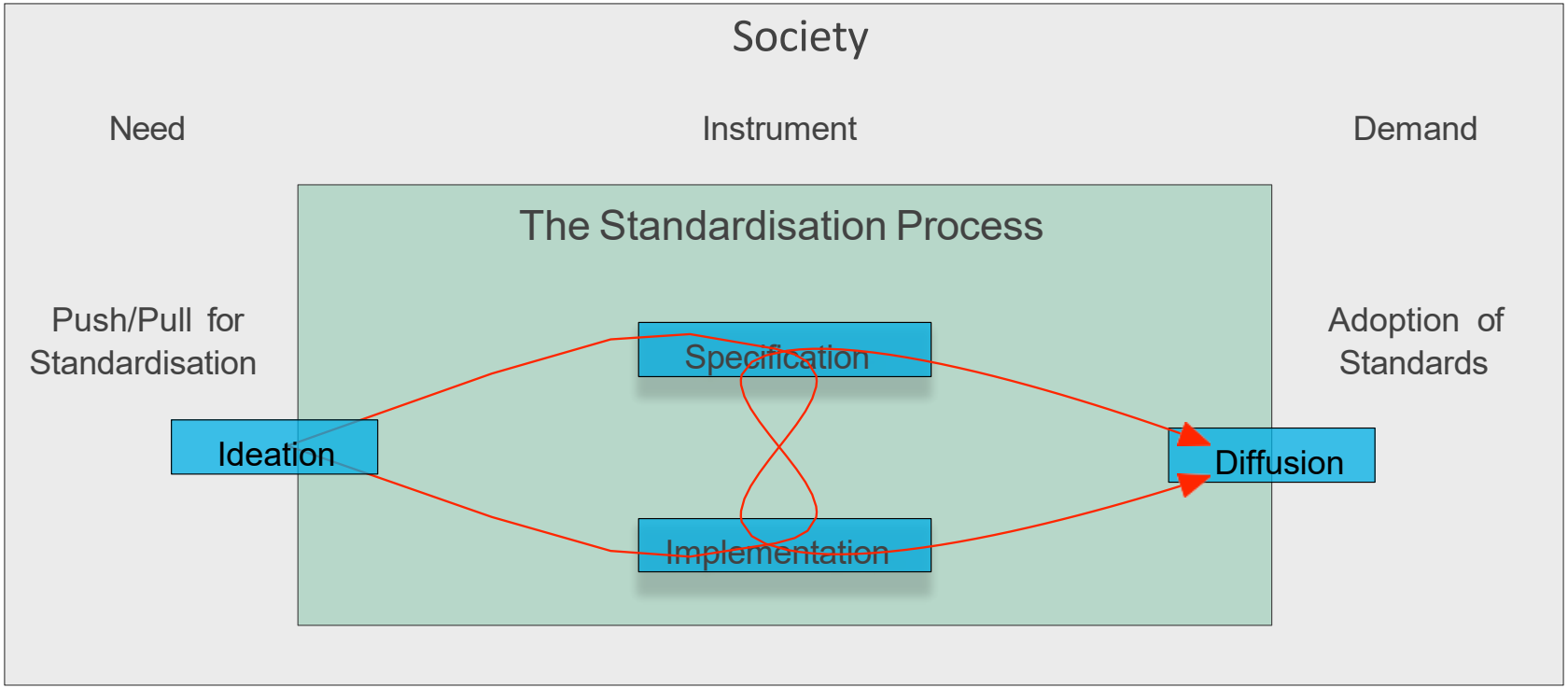
Funded by the European Union



Funded by the European Union



Funded by the European Union


Society
Need
Instrument
Demand
The Standardisation Process
Push/Pull for Standardisation
Specification
Adoption of Standards
Ideation
Diffusion
Implementation

- The phase model is able to describe a variety of early, late or parallel real-life standardisation processes.
  - Ideation
  - Specification
  - Implementation
  - Diffusion and adoption
- Key to the phase model are the concepts of *standardisation instruments* that cause *standardising effects*.

Funded by the European Union

Common Opportunities and Threats in the ICT Sector

- Digitalisation and globalisation are highly impactful *sea changes*:
  - Development of improved methods of collaboration.
  - Trend towards openness and transparency.
  - Shift of relevance from national to supra- and international collaboration and regulation.
  - Shift of the role of the modern state from an employer and producer to a regulator. (Tirole, 2017)

Funded by the European Union

- Strengths: rapid prototyping, release early/release often, voluntary participation, the upstream/downstream model
- Weaknesses: supply chain management, license compliance, limited understanding of meritocracy

Funded by the European Union

- Strengths: proven processes, defined IPR policies, reach, impact
- Weaknesses: the “standards development habitus”, ambiguous IPR policies, cumbersome processes, outdated business models

Disadvantages (weaknesses matched with weaknesses)

- Difficulty dealing with early investment-heavy R&D: SEP/FRAND debate
- Globalisation vs vested interests (regional relevance and recognition of SSO) vs lack of influence (OSS)
- “Old-fashioned” (SSO) vs not fully established (OSS) IPR policies: unclear responsibility for defining new norms (definition of open standards, FRAND, . . .)

Funded by the European Union

- Standard-Setting Organisations and Open Source Communities
  - create complementary products
  - by applying competing processes.

⬇️ — Pace of Innovation — ⬆️

Hardware - Interfaces - Software

⬆️ — Cost of Change — ⬇️

- *Complements* from the product perspective:
  - EPO point of view: “Specification is everything”
  - SSO point of view: “Implementation follows specification”
  - FOSS point of view: “Implementation is everything”
- FOSS products complement standards and are often the default implementation.

- *Replacements* from the process perspective:
  - SSO: Membership often expensive, by nomination, regional, not very open.
  - FOSS: Voluntary contributions welcome, meritocracy.
- Openly governed FOSS communities can be a replacement for SSO processes.

- The main issue issue is the process incompatibility.

- Other issues: *Replacements* from the process perspective:
  - breaking up exclusive clubs,
  - expectation of meritocracy and transparency,
  - pace of innovation
  - see “Requests For Comments (RFCs)”: informal standards that define how the internet works

The . . . OCI . . . is a lightweight, open governance structure (project), . . . , for the express purpose of creating open industry standards around container formats and runtime.

– Open Container Initiative

- Charter of the Cloud Native Computing Foundation:
  - “Role of the CNCF: . . . foster common technical standards . . . ”

- “The Joint Development Foundation is a nonprofit that provides a “standards organisation in a box” to enable groups to quickly establish projects.”

- Projects: GraphQL, Trust-over-IP, UltraEthernet, ...

Funded by the European Union

"The Linux Foundation . . . is a trade association . . . It is not a charity, or a public service organisation. It is an association of businesses. . . "

– Software Freedom Law Center

Practical Implications

Funded by the European Union

Development phases in practice

Practical Implications

- specification-first:
  (early) ECMAscript, (early) C++,
  WhiteRabbit, GENIVI
- implementation-first:
  Cloud Foundry, OpenStack,
  Kubernetes, Automotive Grade Linux
- parallel:
  (late) ECMAscript, (late) C++

Nick Bramhall, “Reflected Industry” [8]

Paradigm Shifts: The Role of Standards

Practical Implications

- Standards enable competition (for implementation market share)
- Standards enable interoperability (between conforming products)
- Standards mitigate cost of change
- Joint implementations are the standard
- Specification leads to fragmentation

Lulu Hoeller, "Keep Calm and Walk the Dog" [9]

State of the Art . . . Commodity?

Practical Implications

- The (A?) business model of Open Source is to realise cost savings through pooled R&D investments into non-differentiating technology.
- It is still early-investment-heavy R&D.
- So it is state of the art.
- And innovative.
- But still non-differentiating.
- And a commodity.
- And a public good.

jackellum2, “Commodity Centre, Braxted - Oct’15 - 5300 SOP” (public domain) [10]

Negotiating over a Penny

Practical Implications

- FOSS: Zero negotiation
- SDO-RF: Zero negotiation
- SDO-FRAND: undefined

- Not a FOSS related argument per se!

Joybot, "Legal stamp – Conveyance (1964)" CC BY [11]

Funded by the European Union

- In most circles, innovativeness to day is still measured by the number of patents and patent applications. In particular, proxy metrics of innovativeness are:
  - Annual R&D budget
  - Number of patents filed
  - R&D headcount or budget
  - Number of active R&D or standards development projects
  - Number of patentable ideas identified
  - …

Barta IV, "1800s Library" [12]

References

[1] Knut Blind and Mirko Boehm. *The Relationship Between Open Source Software and Standard Setting*. 2019.

[2] Knut Blind, Mirko Böhm, and Nikolaus Thumm. “Open Source Software in Standard Setting: The Role of Intellectual Property Right Regimes”. In: *Open Source Law, Policy and Practice*. Oxford University Press, Oct. 2022.

[3] Mirko Boehm and Davis Eisape. “Normungs- und Standardisierungsorganisationen und Open Source Communities - Partner oder Wettbewerber?” In: *Normen und Standards für die digitale Transformation: Werkzeuge, Praxisbeispiele und Entscheidungshilfen für innovative Unternehmen, Normungsorganisationen und politische Entscheidungsträger*. Ed. by Axel Mangelsdorf and Petra Weiler. Walter de Gruyter GmbH & Co KG, 2019, pp. 99–140.

[4] Mirko Boehm and Davis Eisape. “Standard setting organizations and open source communities: Partners or competitors?” In: *First Monday* 26.7 (June 2021).

[5] Free Software Foundation Europe. *Why is FRAND bad for Free Software?* URL: https://fsfe.org/activities/os/why-frand-is-bad-for-free-software.en.html (visited on 01/11/2019).

[6] European Commission. *Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee: Setting out the EU approach to Standard Essential Patents*. Publications Office of the European Union, Nov. 2017.

[7] Bruce Perens. *On Usage of The Phrase "Open Source"*. Sept. 2017. URL: https://perens.com/2017/09/26/on-usage-of-the-phrase-open-source/ (visited on 04/11/2020).

[8] Richard M. Stallman and Lawrence Lessig. *Free software, free society: selected essays of Richard M. Stallman*. SoHo Books, 2010.

[9] Jean Tirole. *Economics for the common good*. Princeton University Press, 2017.

Funded by the European Union

EDU4 Standards.eu

Follow us!.

edu4standards

@edu4standards.bsky.social

EDU4standards

Funded by the European Union

info@edu4standards.eu |
www.edu4standards.eu