

# Introduction

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# Disclaimer

- *Although the author has made every effort to ensure that the information in this slideset was correct at time of writing and while this slideset is designed to provide accurate information in regard to the subject matter covered, the the author assumes no responsibility for errors, inaccuracies, omissions, or any other inconsistencies herein and hereby disclaim any liability to any party for any loss, damage, or disruption caused by errors or omissions, whether such errors or omissions result from negligence, accident, or any other cause.*
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# Motivations for the course

What are we here for?

# Standards and Regulation in ICT

- What is a standard?
  - Middle English (denoting a flag raised on a pole as a rallying point, the authorized exemplar of a unit of measurement, or an upright timber): shortening of Old French *estendart*, from *estendre* ‘extend’; in standard, influenced by the verb stand.
- What is a regulation?
  - It remembers of some “rule” imposed an authority
  - It recalls something related to the law

# Standard from Merriam-Webster

As a noun

1. a conspicuous object (such as a banner) formerly carried at the top of a pole and used to mark a rallying point especially in battle or to serve as an emblem
2.
  - a) a long narrow tapering flag that is personal to an individual or corporation and bears heraldic devices
  - b) the personal flag of the head of a state or of a member of a royal family
  - c) an organization flag carried by a mounted or motorized military unit
3. something established by authority, custom, or general consent as a model or example
4. something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality

As an adjective:

1. constituting or conforming to a standard especially as established by law or custom
2. regularly and widely used, available, or supplied

# How many standards there are in your laptop?

- From “B. Biddle, A. White and S. Woods, "How many standards in a laptop? (And other empirical questions)," *2010 ITU-T Kaleidoscope: Beyond the Internet? - Innovations for Future Networks and Services*, Pune, India, 2010, pp. 1-7, doi: 10.2139/ssrn.1619440.”
- **Abstract:**
- An empirical study which identifies **251 technical interoperability standards implemented in a modern laptop computer**, and estimates that the total number of standards relevant to such a device is much higher. Of the identified standards, the authors find that 44% were developed by consortia, 36% by formal standards development organizations, and 20% by single companies. The intellectual property rights policies associated with 197 of the standards are assessed: 75% were developed under “**RAND**” terms, 22% under “royalty free” terms, and 3% utilize a **patent** pool. The authors make certain observations based on their findings, and identify promising areas for future research.

# An example of a standard

**IEC 62680-1-3:2022**

**Universal serial bus interfaces for data and power - Part 1-3: Common components - USB Type-C® cable and connector specification**

IEC 62680-1-3:2022 defines the USB Type-C® receptacles, plug and cables. The USB Type-C Cable and Connector Specification is guided by the following principles



# But what is exactly a standard? A document



**IEC 62680-1-3**

About 400 pages

Edition 5.0 2022-09

**INTERNATIONAL  
STANDARD**

**NORME  
INTERNATIONALE**

You can **buy** it at 425 CHF  
(about 450€) at the IEC  
store





# Are you forced to use the USB-C ?

- There is a European Directive

L 315/30

EN

Official Journal of the European Union

7.12.2022

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## DIRECTIVES

**DIRECTIVE (EU) 2022/2380 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**

**of 23 November 2022**

**amending Directive 2014/53/EU on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment**

# And then in EU

## Specifications relating to charging capabilities

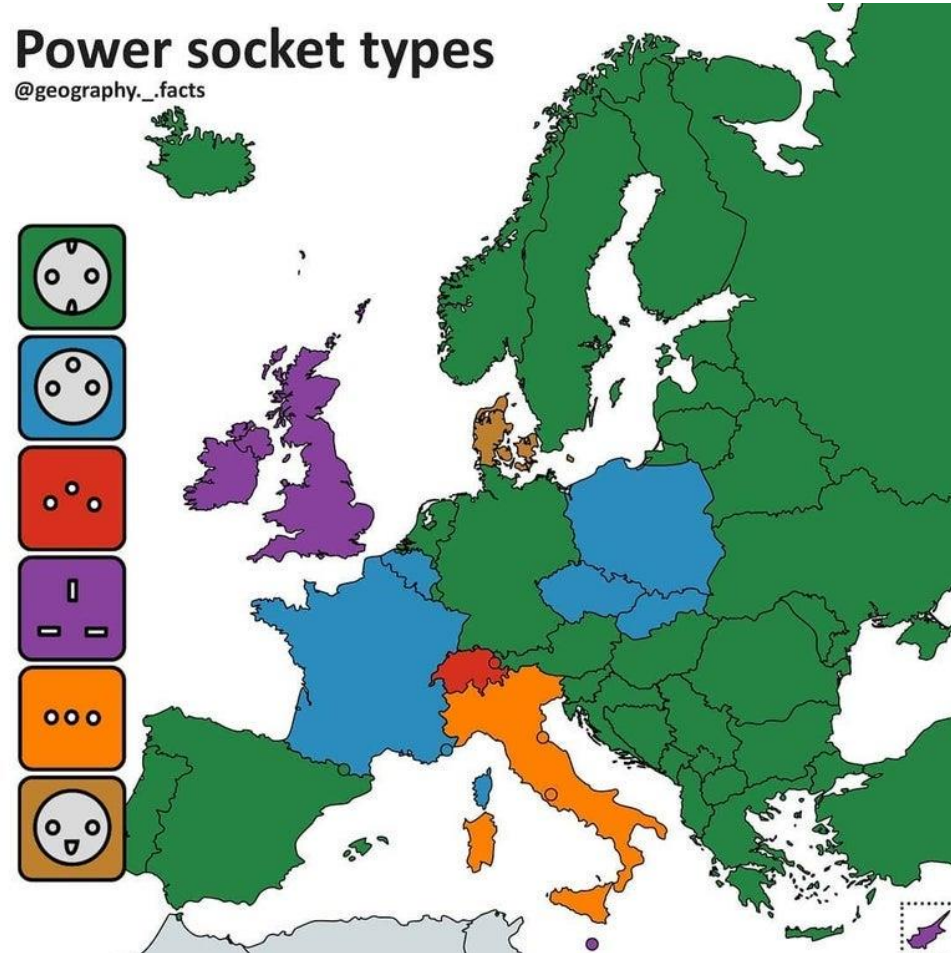
1. The requirements set out in points 2 and 3 of this Part shall apply to the following categories or classes of radio equipment:
  - 1.1. handheld mobile phones;
  - 1.2. tablets;
  - 1.3. digital cameras;
  - 1.4. headphones;
  - 1.5. headsets;
  - 1.6. handheld videogame consoles;
  - 1.7. portable speakers;
  - 1.8. e-readers;
  - 1.9. keyboards;
  - 1.10. mice;
  - 1.11. portable navigation systems;
  - 1.12. earbuds;
  - 1.13. laptops.
2. In so far as they are capable of being recharged by means of wired charging, the categories or classes of radio equipment referred to in point 1 of this Part shall:
  - 2.1. be equipped with the USB Type-C receptacle, as described in the standard EN IEC 62680-1-3:2021 “Universal serial bus interfaces for data and power – Part 1-3: Common components – USB Type-C® Cable and Connector Specification”, and that receptacle shall remain accessible and operational at all times;
  - 2.2. be capable of being charged with cables which comply with the standard EN IEC 62680-1-3:2021 “Universal serial bus interfaces for data and power – Part 1-3: Common components – USB Type-C® Cable and Connector Specification”.

# Contradictions ...



## Power socket types

@geography.\_facts



# A standard is a document ....

3GPP Release 16  
165,745 Pages

**Let's suppose to print it**

0.1 mm per page
0.0001 m per page
165745 pages
82873 Pages, two side printing
8.2873 m total height

The typical inter-storey height is set at 4.50 m for the ground floor and 3.50 m for the further floors.

**About 2 floors (ground+1<sup>st</sup> floor)  
More than two floors (further floors)**

# First motivation for this course

- Standards are mentioned in the Law

In the program of Law and Technology,

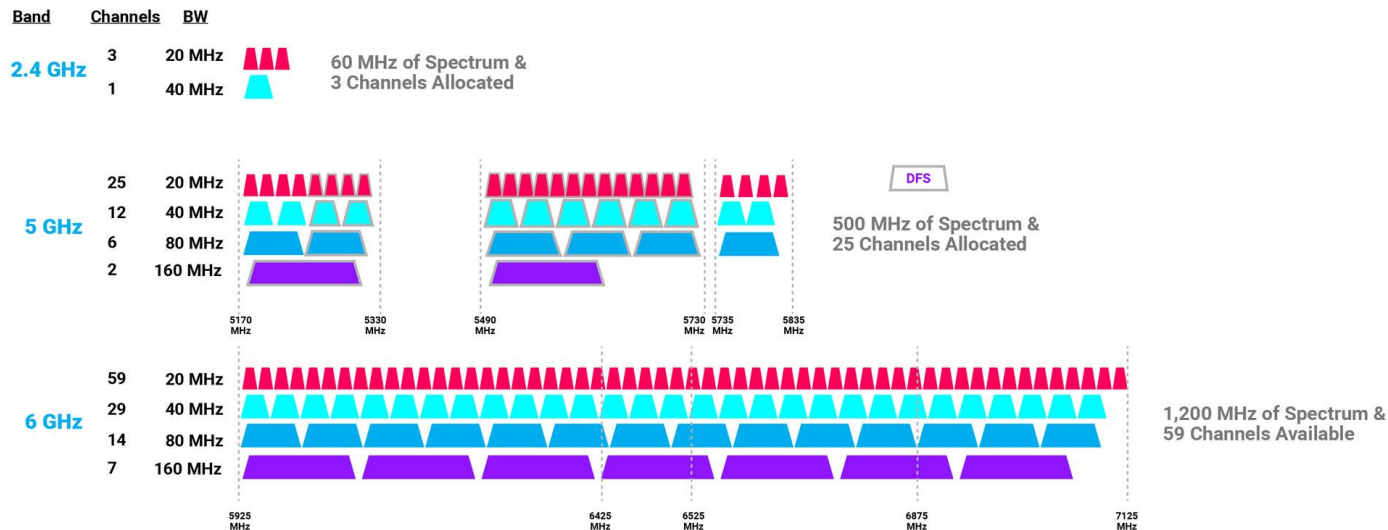
- What standards are
- Who make standards and how
- If, how, why standards are legally binding

must be understood as they are one the best examples where **Law and Technology meets**

# Back to your laptop an standards



## Wi-Fi 6E



A Comparison of Wi-Fi Spectrums: via Broadcom

- Can anyone else transmit “where” WiFi® “works”?
- Can anyone else transmit “where” the 4G (LTE) “works” ?
- By the way: is WiFi® a standard?



# Radio “spectrum” is a public resource

“Someone” needs to regulate its use

- In EU: **Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision)** [here you can find it](#)

*The decision establishes a Radio Spectrum Committee, which is chaired by the European Commission. The committee comprises representatives of the EU Member States and examines proposals on technical measures to harmonise conditions for the availability and use of the radio spectrum.*

*Building also on the general principles contained in the radio spectrum policy programme, adopted under Decision No 243/2012/EU, **the Radio Spectrum Committee assists the Commission in defining, developing and implementing EU radio spectrum policy.***

*The committee also issues opinions on the mandates transmitted by the Commission to the **European Conference of Postal and Telecommunications Administrations (CEPT)** on the harmonisation of radio frequency allocation and the availability of information relating to the use of the spectrum. The Commission’s draft measures, once approved by the committee and adopted by the Commission, are binding throughout the EU and have to be followed by Member States when granting rights to use spectrum.*

# Second motivation of this course

ICT technology is a common good and use common goods (e.g. the radio “spectrum”); as such it must be **regulated** via law or similar means.

In the program of Law and Technology, the Regulation of ICT must be understood as it is one the best examples where **Law and Technology meets**



# Third motivation of the course

- ICT technology is pervasive and studying what is possible or not, legally and technologically, **makes you better citizens** knowledgeable of what is behind certain decisions which directly affects you directly
- **We are not going into technical details (although some basic understanding of the ICT technology is beneficial): in this course we want to explore who decides what about the ICT technology; it is a funny world ... but a little messy**
- **You are going to benefit from this course in your everyday life as well, not only as professionals**

# About your instructor (check LinkedIn)

- MSc EE (major automatic control)  
UNIPD, 1992
- Ph.D. EE (major Telecommunications),  
UNIPD 1995
- Executive MBA, UNIBO, 2004
- Executive training Entrepreneurship at  
Babson College, Boston, USA 2004
- **Bachelor in Law and Technology**  
**UNIPD, 2024**
- Other specific courses on Project  
Management, etc.
- Full professor of  
**Telecommunications, UNIPD**
- Founded 3 startups (1 exit)
- **Manager** in the telecommunications  
industry worldwide (executive roles) ~ 6  
year
- Working in the telecommunications  
industry ~ 10 years
- Member of: IEEE (senior), AEIT,  
ETSI, UNINFO → CEN/CENELEC  
JTC21
- **Quite some work in telecom  
standardization**

# Office hours and sending emails

- Where:
  - Department of Information Engineering (DEI)  
via Gradenigo 6/B  
35131 Padova  
Room: 227 DEI/A
- When:
  - On Wednesdays 15:00-16:00
  - Please book by email (see how to send emails)
- If you send me an email, please insert in the subject **[STD-25-26]** otherwise your mail is likely to get lost: I receive hundreds of emails per day; with this tag I can highlight your emails and give them priority
- I will not read emails out of office hours (Mon-Fri, 9-18)



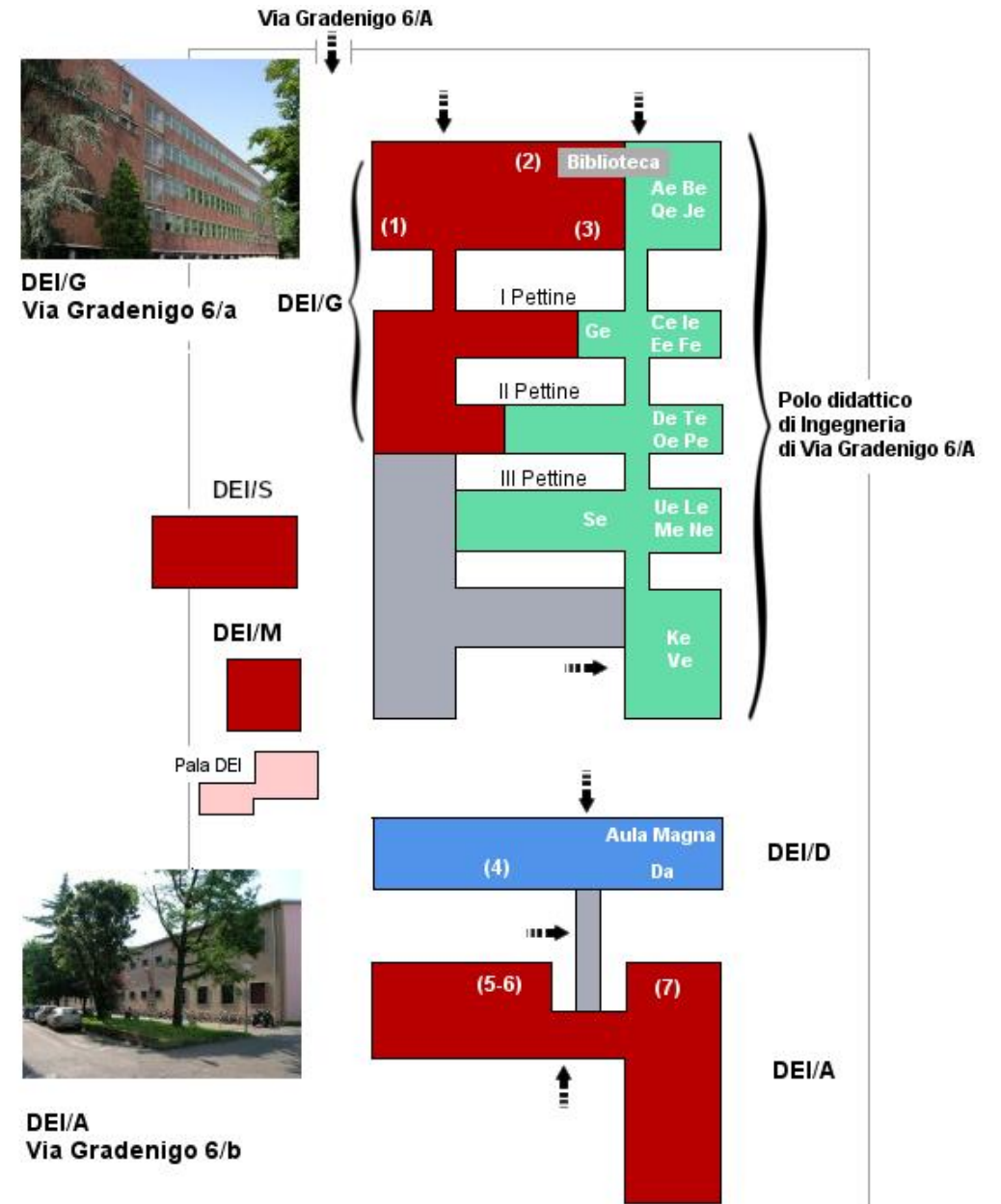
# How to get to my office



# Map

## Building DEI/A

Call me on my office number and I will open the door of the corridor (to open it an authorized badge is needed)



# Orienteering

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# What is a standard (formal definition)

- Documents, 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)
  
- NOTE Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits (ISO/IEC Guide 2:2004)



# SDO participation models

1. National Delegation (e.g. ISO, IEC, CEN/CENELEC, ETSI)
2. Organizational membership (e.g. OneM2M, ETSI)
3. Professional representation (e.g. IEEE-SA)
4. No formal membership (IETF)

# The World Trade Organization

- No unnecessary restriction of international trade Technical Barriers to Trade
- (TBT) Agreement
  - Avoiding unnecessary trade obstacles vs allowing for regulatory autonomy to protect legitimate objective
    - Examples legitimate objectives: protection of human health, protection of animal or plant life, national security

# The EU – main institutions



# When EU was regulating cucumbers

16. 6. 88

Official Journal of the European Communities

No L 150/21

**COMMISSION REGULATION (EEC) No 1677/88  
of 15 June 1988  
laying down quality standards for cucumbers**



Credits Muu-Karhu  
unmodified



# New Legislative Framework (2008)

- Improved market surveillance
- Accreditation rules for Conformity Assessment bodies
- Rules for requirements for notification of Conformity Assessment bodies

## Clarifications on CE marking

- New legislative tools
- The “rationale” remains: EC sets non-negotiable requirements, ESOs create voluntary harmonized standards to prove compliance with these requirements

# Standards as Public-private partnership (PPP)

- European standardisation system based on a public-private partnership between the Commission and the standardisation community (private non-for-profit organisations):
  - European Committee for Standardisation (CEN),
  - European Committee for Electrotechnical Standardisation (CENELEC), and
  - European Telecommunications Standards Institute (ETSI).
- Standardisation activities at these organisations are based on consensus-building among different actors, including industry, SMEs, trade organisations, and other private, societal, and public stakeholders.
- The Commission is responsible for assessing European harmonised standards developed to support EU law and for their reference in the Official Journal of the EU.
- The Commission provides financial support to the three European Standardisation Organisations, for their work in support of EU legislation and policies.

# Conformity via harmonized standards

- Conformity assessment procedures (e.g., testing & certification), carried out before the product is placed on the EU market
- Procedure specified in sector-specific legislation (e.g., self-assessment or testing by **notified bodies**)
- Upon successful assessment – declaration of conformity & affixing CE-marking (for products)

# Standardization, democracy and epistemic legitimacy

- Does not cater sufficiently to public interest
- Little participation of societal stakeholders/citizens/SMEs/consumers
- Too much power to (foreign) companies
- Insufficient to guarantee EU resilience and global competitiveness