Chapter 2

The Basics of ICT Standardization

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**Forming the Next Generation of ICT Standards People: A Day of Teaching Standardization**

6 October 2022

Who I am at a glance

- Full Professor at Department of Naval, Electrical, Electronic, and Telecommunication Engineering (DITEN), University of Genoa
- Deputy Director of CNIT (National Inter-University Consortium for Telecommunications).
- Responsible of the CNIT participations to ETSI and ITU-T
- Member of ETSI EE and Cyber TCs and ITU-T Group 5.
- Coordinator of the Genoa University Master Course in Internet and Multimedia Engineering
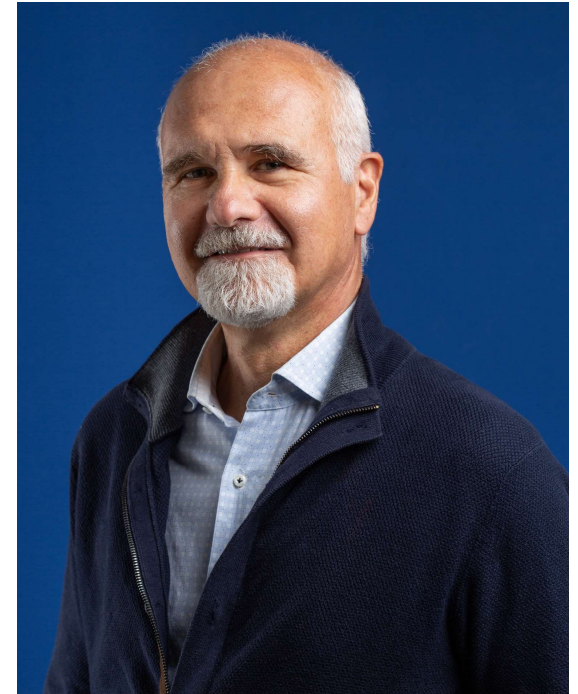
Outline

- Chapter 2 design goals (requirements)
- Content short description
- Teaching suggestions
  (from direct and indirect personal experiences)
- Questions & discussion

In designing this chapter, we had specific objectives/requirements (adopted in both editions).

Some objective are specific for the chapter, others are common for all the book.

In particular, our main objectives were to have content:

- accessible and effective even for readers starting from scratch;
- comprehensive and self-contained;
- introductory to all subsequent contents/chapters

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Accessible and effective even for readers starting from scratch means (among others):

- simple and easily readable;
- with many examples;
- without too much specific wording;
- support a seamless reading of the entire chapter.

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Comprehensive and self-contained means (among others):

- to respect the modular approach adopted for the whole book;
- to include the minimum basic knowledge for understanding the entire subject;
- to include the adopted basic definitions.

An entry point for all subsequent contents/chapters means (among others) that:

- it touches a large part of the arguments explained in detail in the following chapters;
- it can act as a sort of "guide" for people looking to select specific topics, thanks to the many included pointers to the other chapters;
- the book can be customized (in some sense) by adding to the first chapter a sub-selection of the next ones.

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The sections:

- ◉ Basic of standardization

- ◉ Benefits and risks of standardization

- ◉ ICT standardization landscape

- ◉ The standardization process at a glance

- ◉ Using standards

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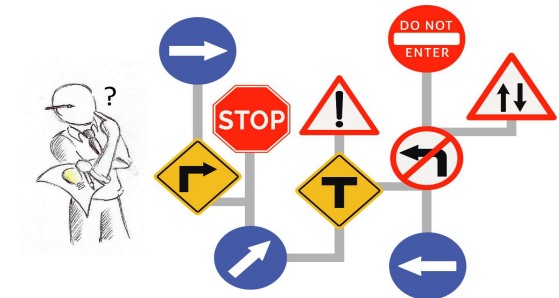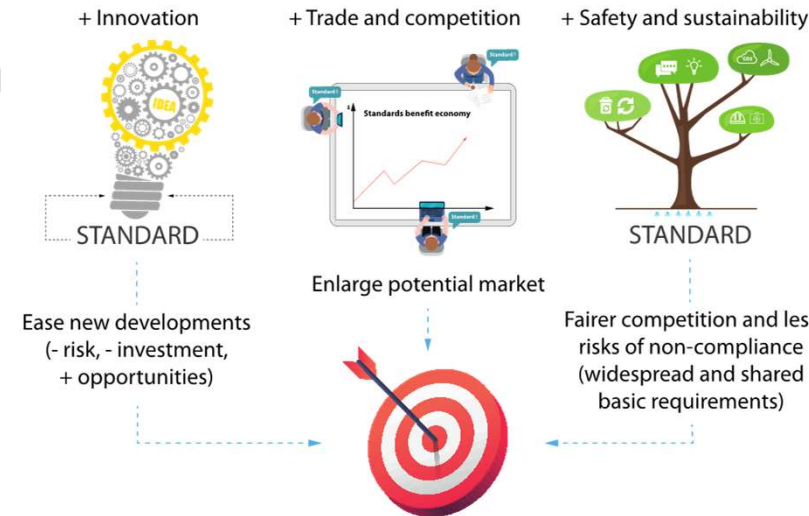
2.1 Basic of standardization

- **First definition of standard and SDOs,** difference between "de facto" and SDO standards.

- Impact of standards on our life.

- Definition of **formal standardization** and relationships with regulation.
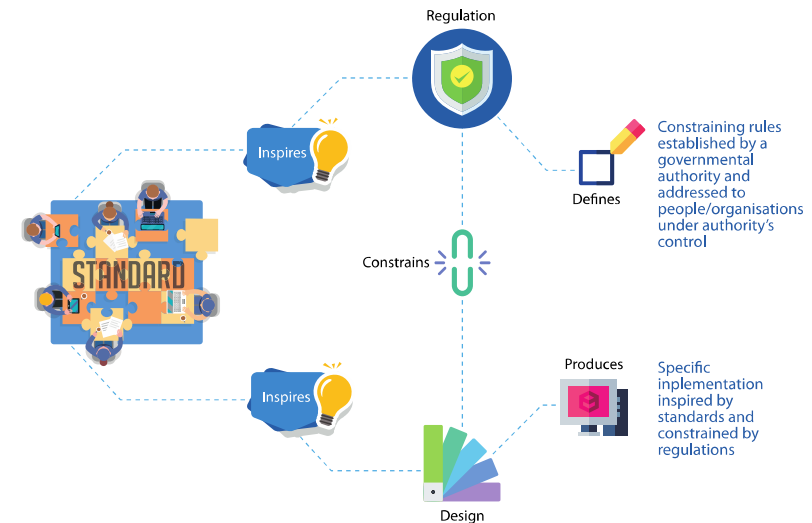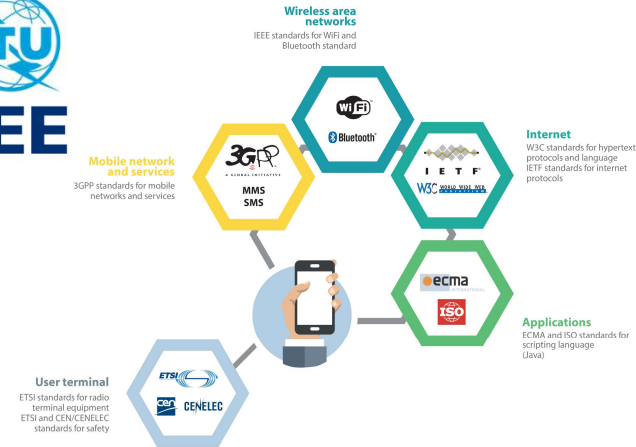
2.2 Benefits and risks of standardization

- **Benefits** on innovation, trade and competition, safety and sustainability.
  - analyzed with respect to both society and industrial points of views.

- **Risks** of jeopardized innovation, not fair competitions and inconsistences of standards
  - All the risks include a part of "Measures to put in place to minimize risks"

+ Innovation

STANDARD

Ease new developments
(- risk, - investment,
+ opportunities)

+ Trade and competition

Standards benefit economy

Enlarge potential market

+ Safety and sustainability

STANDARD

Fairer competition and less
risks of non-compliance
(widespread and shared
basic requirements)

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2.3 ICT standardization landscape

- Classification of SDOs
  - Geographical coverage
  - Technical scope of activities
 - Level of recognition from regulatory or political organizations
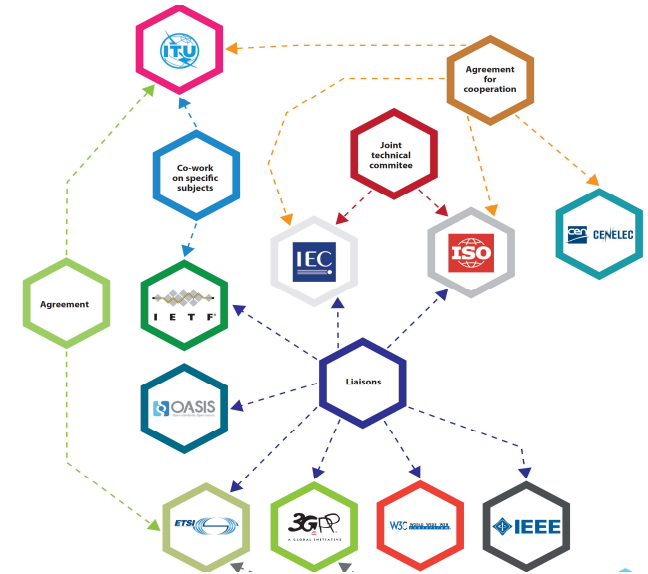
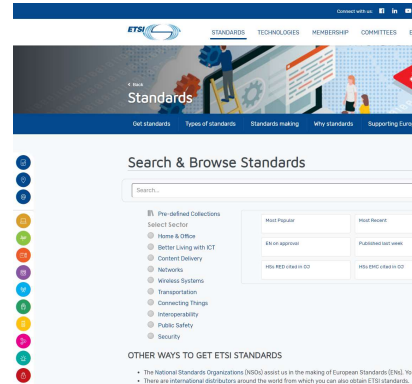## 2.4 The standardization process at a glance

- Standard development process
- Main characteristics of a standard

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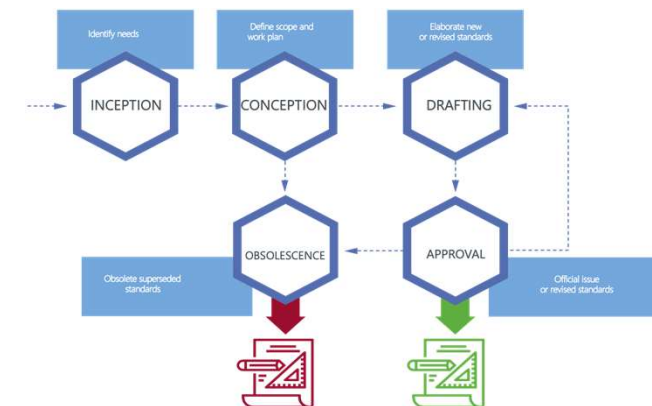
2.5 Using standard

- **How to find a standard**
  - **Select relevant SDOs**
  - **Identifying and accessing SDO documents**
- **Understanding structure and formalism of the standards**
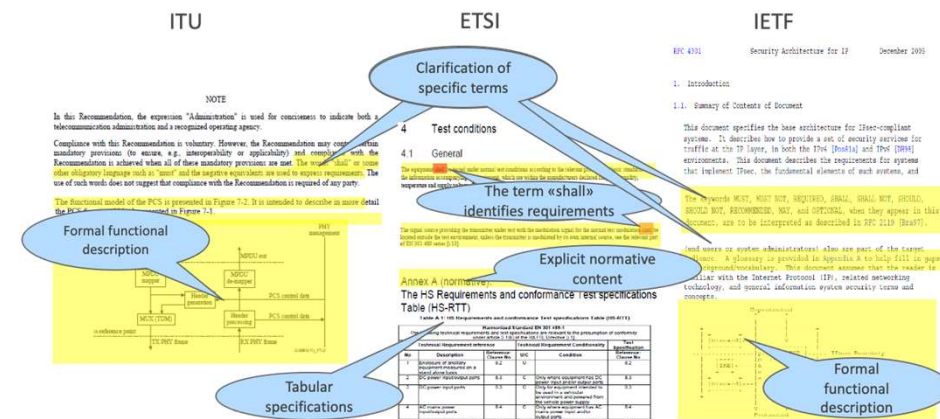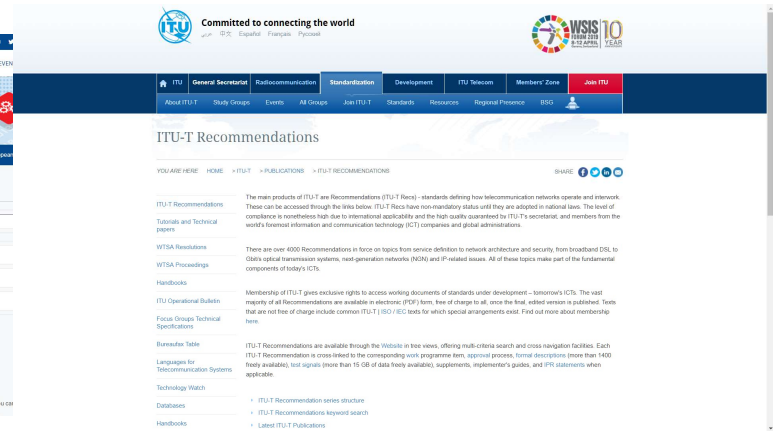
The scenario in which my experience refers:

- Full Professor at Polytechnical School (engineer + architecture faculties) of the University of Genoa
- Expertise is in the area of **Telecommunication Networks and Cyber Security**
- Involved mainly in curricula of Telecommunication, Computer Science and Electronics
  - Coordinator of a Master's course in Internet and Multimedia Engineering
  - I taught/tech classes at all three main university levels: Bachelor's, Master's, and doctoral degrees (but most of my classes are in Master's courses).
  - A large part of current experience refers to the first edition of the book.
  - I must remind you that in the covid period the restrictions influenced the results and perceptions of both students and teachers.

Teaching suggestions

A crucial preliminary remark concerns the time needed to teach the subject.

- Engineering courses usually are already heavily loaded with topics that most lecturers consider indispensable.
- Although this subject is, in my opinion, also indispensable for a modern engineer, it often does not enjoy great popularity among teachers.
- To include it in the curricula, therefore, often requires a minimalist approach in terms of teaching time, at least initially.
- This approach obviously makes it more difficult for the teacher to be effective and attractive to students.

Considering this problem, I have included two time-ratings in the following slides: the minimal and the optimal one.

How long and where to teach the argument in my experience:

- At first University level (Bachelor)
  - the main goal might be to make the students aware of the topic and its relevance.
  - This result can be achieved by using the chapter 2 content only
    - as a part of a course (more effective, with the topic part of the examination)
    - or in a seminar that can be eventually offered to more than one degree (more efficient)
  - The requested teaching time: 2 – 3 hours *(6 hours).*

How long and where to teach the argument in my experience

- **At second University level (Master)**
  - my personal reference content is chapter 2 (Introduction), chapter 3 (ecosystem), chapter 4 (production of standard) + hints to some of the other chapters (mainly 5 and 7)
  - Presented as one of the topics of a class (e.g. , Telecommunication Network, Wireless technologies)
  - The requested teaching time: 6 – 10 hours (*25 hours*)

- **At Ph.D. level**
  - The entire book (with some chapters summarized at least partially)
  - Presented in a dedicated course
  - The requested teaching time: 18 hours (*30 hours*)

A frequent behavior of engineering students

- ◉ They generally focus mainly on two types of contents:
  - ◉ those with a lot of mathematics, modelling, and physics
    - ◉ mainly because they are considered the most difficult ones
  - ◉ those that involve significant application and practical activities
    - ◉ Because they are more fun and because you can easily understand their interest in a future job

The standardization topic at first is out from these two categories

- ◉ so, the topic potentially might not attract students, who sometimes tend to classify it as partially boring and not so relevant (apparently too simple).

- ◉ beyond the personal ability of the teacher to make the subject taught interesting and relevant, additional effective ways to increase the interest on this subject can be:

  - ◉ to link strictly one or more technical arguments with the standard description.

  - ◉ to use many examples and especially **introduce practical experiences and projects.**

  - ◉ to create relationships with eventual Soft-Skill classes.

Any further questions?

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