Abstracts

06 What do voluntary standards bring to digital technology? Why the interest in them?

Olivier PEYRAT & Jean-François LEGENDRE

In the digital realm, proprietary standards, voluntary standards and technical specifications from consortiums or forums coexist but for quite different purposes. The digital transformation of society has not been smooth sailing. Appetites have been whetted for exploiting opportunities, capturing the value thus created and bolstering positions in competition or even as rentiers. To deal with this situation, voluntary standards are intended to be neutral in relation to technology. Thanks to them, a multitude of parties can innovate while cooperating and forming groups but under conditions such that the law of the survival of the strongest is not always the best. If all stakeholders in the digital realm are effectively implicated, voluntary standards can allow for the emergence of "good" practices, in particular around use cases. The objective is to build up confidence, make the digital transformation more acceptable, and avoid "blind spots" (situations in which a category of stakeholders either wins or loses everything).

11 Openness, technical standardization and regulation

Pierre-Jean BENGHOZI

In information and communications technology even more than in other branches of industry, standardization is a key factor for regulating competition. However, the economic issues, given their importance, set limits on a standardization that combines cooperation (in drafting standards) and competition (in applying them). Given the characteristics of present-day technical systems, it is time to reconsider the place and forms of standardization, which, by its very nature, lies outside the scope of economic regulations in the strict sense of the word. New developments in telecommunication networks have upended historical standardization procedures, which are open to a new conception of standards centered around the issue of interoperability. Guaranteeing that the Internet remains open means knowing how to adjust the economic and technical limits on access that a network's material characteristics impose.

16 Standardizing the Internet of Things: ETSI and AIOTI

Patrick GUILLEMIN

Where to start in order to learn how standards are being drafted and set for the Internet of Things (IoT)? and why the European Telecommunications Standards Institute (ETSI) presides the standardization group in AIOTI (Alliance for Internet of Things Innovation)? A key factor has been 3GPP/ETSI TC MSG (mobile networks) et oneM2M/ETSI TC SmartM2M (M2M/IoT) and their links to AIOTI. These projects of standardization, which sought to solve problems of cybersecurity and interoperability on the IoT, had close ties with R&D programs funded by the European Union. This introduction with its short, up-to-date bibliography will hopefully stimulate the reader to take a closer look at ETSI and AIOTI…

22 Digital standards and green information technology

Amélie BOHAS, Françoise BERTHOUD & Gabrielle FELTIN

Green information technology is a rather recent topic. Since it is in a formative stage, it comes as no surprise that the development of standards in this field is still lagging. Given the stakes however — the conservation of resources or the reduction of pollution and greenhouse gases — progress must continue being made. A presentation of the guidelines, regulations, standards and others forms of regulation that are tending in this direction…

31 Standards and competition in communications technology

Axel GAUTIER & Justine BULKAERT

Given network externalities, the joint use of technical standards increases the compatibility between goods and thus benefits users. In recent years, communications technology has developed thanks to shared standards drafted in standardization organizations. A standard includes patents that are said to be "essential" to it and for which users must obtain a license. These "essential" patents are a bottleneck in the process. They grant a major competitive advantage to the patent-holders, whence questions about the relation between standardization and competition. The issue of whether regulatory authorities should intervene is being debated. This brief discussion of the consequences of standardization on competition both upstream from, and downstream in, the market takes mobile communications as an example.

37 The battle between WiFi (IEEE) and HiperLAN (ETSI)

Philippe JACQUET

The title does not do justice to the suspense. If you're not from Mars, you know what WiFi is. A riddle: 25 years ago, WiFi (under standards from the Institute of Electrical and Electronics Engineers, IEEE) and HiperLAN (under standards created by the European Telecommunications Standards Institute, ETSI) were in the same boat. Which one fell into the water?

42 5G Standardization

Achilleas KEMOS, Bernard BARANI & Peter STUCKMANN

The importance of 5G Connectivity was expressed by President Juncker and in the European Commission's 5G Action Plan. The visionary EU-funded research activities initiated by the Commission back in 2012 led to the European 5G Public Private Partnership (5G PPP). An important policy objective has been to foster, under EU leadership, the emergence of global industry standards for key 5G technologies. The 3rd Generation Partnership Project (3GPP) is the principal global standardization body for standardizing 5G. In 2018, it celebrated its 20th anniversary. Hundreds of industry contributions to 3GPP have come from projects supported under 5G PPP. During 2018, Release 15 was finalized; and Release 16, launched. 3GPP has managed to deliver 3G, 4G and 5G standards and maintain a high level of efficiency, despite the incredible complexity, an intense process that might encounter delays in implementation. The European Commission is following developments, attentive that the inclusive standardization process remains inclusive.

48 The standardization of cloud computing
Cédric SIBEN

Stemming from the actions of a few Internet firms (Google, Amazon, Facebook…), cloud computing initially developed outside any normative framework. In 2012, given the success of this new proprietary form of information technology, traditional European operators in information and communications technology became aware of the need for "fluidity" in this market. Their action led to a set of internationally recognized standards whereby customers are to understand the offers made, data and services are to be portable, and applications are to be interoperable. Between 2014 and 2016, a body of standards (ISO/UIT-T) was released. These standards, recognized by all parties active in this field, are a positive factor in the massive adoption of cloud computing. A list of these standards and an account of how they have been instituted…

56 Standardization and big data
Charles HUOT

During 2014 and 2015 under the auspices of AFNOR, a work group — 32 persons from various fields (health, energy, the armed forces, documentary services…) and experts in technology representing public authorities and research laboratories — reflected on the question of standardization and big data. As chair of the Big Data Alliance, AFNOR, the French standards organization, proposed that the author head this group along with Jean-François Legendre as rapporteur to AFNOR's Committee of Strategic Orientation. Twelve months later, a white book (*Données massives ou "Big data": Quels défis pour la normalisation?*) was published and presented to the public on 15 June 2015. The principal points in this publication are updated…

61 Standardization and the radio frequency spectrum
François RANCY

The radio frequency spectrum is a scarce resource for most applications on which our societies have become so dependent over the past few decades. Its management is based on a system of international standards and regulations adopted under the auspices of the International Telecommunication Union (ITU) following a procedure that, undertaken by member states, associates the major stakeholders (operators, industrialists, international organizations, trade groups) who use this spectrum. This procedure is intended to result in a regional and worldwide consensus about the best way to manage the spectrum and to help national and international regulatory frameworks evolve together so as to adapt to rapidly changing technology and its uses, but without jeopardizing the investments already made. In place for 112 years now, this process for producing regulations and standards with a universal scope has allowed for the development of radio communications as it now exists.

68 Digital standards and e-health
Karima BOURQUARD

E-health refers to subjects as varied as the patient's search for care or the use of information and communications technology for health purposes. It addresses many an issue, such as the ageing of the population and of health-care professionals, the shortage of medical

experts, the equality of access to care, prevention work, patients' access to their clinical data and rare diseases. E-health involves exchanging or sharing health data from systems that are the source of data toward systems that will use the data in an environment that inspires confidence. Its development very much depends on how these systems interact. Furthermore, interoperability is a requirement essential to e-health's well-being. What is meant by interoperability? What are the variants of this concept in Europe (model-building at various levels)? Over the past twenty years, approaches based on use cases for facilitating the drafting of technical standards have been worked out for e-health; but their implementation is still problematic. The use of platforms of open tests is now the best way to solve problems related to the rollout of e-health programs.

75 Standardizing smart transportation systems
Michelle WETTERWALD

The field of transportation is in the throes of a revolution owing to digital technology. All forms of transport are becoming "smart", a process that involves the drafting of new standards for the digital technology used. Road transportation is a major focus given the number of possible applications (road safety, logistics, "electromobility", driverless vehicles…). Stakeholders in smart transportation systems are working out their solutions, while standardization allows for developing the ecosystem. A few examples of standardization organizations in this field are presented, as well as their standards for direct communication between vehicles, cooperative systems, urban mobility, emergency calls, the Internet of vehicles, and automatic urban rail systems. Complementary aspects of this standardization are pointed out: tests of interoperability; international harmonization and competition between organizations; the definition of a data semantics; and the sharing of the frequency spectrum between the uses and forms of technology.

83 EPUB, a standard and its evolving adoption among e-book publishers
Chloé GIRARD

The first EPUB standard was set in 2007. Nowadays, although few studies have been made on this topic, EPUB has been adopted in quite different ways by French publishers, mainly depending on whether they belong to a group or are independent. By taking a quick look at this standard's history, its creation and evolution, we see the obstacles and eventual incentives that have shaped electronic publishing. EPUB is said to be an initially poor standard that is gradually drawing nearer to its target (the book). There is also talk abut the digital acculturation of professionals whom technology does not fascinate and about a still emerging market.

89 Standards for Web accessibility
Armony ALTINIER

Web accessibility means that sites, tools and techniques are designed and developed so that the disabled are able to use them. This entails upholding technical rules that, though solidly established, are still seldom applied. The law is evolving to provide a better legal framework. Rules are being extended to new uses and even expanding beyond the Web. At stake: attention to the public, whether disabled or not, without any discrimination.

93 The accessibility of e-books
Luc AUDRAIN

Electronic books in EPUB format use standards of Web accessibility to assist persons with "print disabilities". Thanks to encoding techniques for accessibility that have been standardized by organizations, such as DAISY Consortium (Digital Accessible Information SYstem), traditional publishers of books, such as novels, have started systematically producing e-books accessible in the EPUB3 format.

MISCELLANY

96 The 2018 digital barometer survey
Gérard LALLEMENT & Matthias de JOUVENEL

The "digital barometer", a yearly survey on digital equipment and its uses in France, has gradually become the reference source for public authorities, firms and other parties interested in digital technology. In 2018, nearly everyone in France was a cybernaut who used the Internet daily. The penetration rate of devices and their uses have peaked (the social media, on-line commerce) or are even diminishing (computers, tablets). The current momentum comes from new devices and forms of access (smartphones and mobile Internet connections) and new uses (on-line audiovisual and health services, for instance). Although the lack of protection of personal data is the major deterrent to using the Internet, the French are, paradoxically, not ready to put much effort into protecting their personnel data.

103 Copyrights in the digital environment
Alexandra BENSAMOUN

Copyrights in a digital environment provide a field for regulation and for observing changes in legal rules — changes stemming from a new balance of power. The approach to this topic must be pluralist. It must mix "soft law" (for making rules more flexible but so as to involve stakeholders) and "hard law" (for moving beyond the obsolescence of legal regulations in order to make stakeholders accountable).