

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

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Abstract:

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 might 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).

Information and communications technology (ICT) is an essential condition for the globalization of markets.¹ Since digital technology is a means for communicating, storing and processing information so that other devices understand it, standards are a necessity. They might be proprietary when a single firm, sometimes a monopoly, designs devices. From the start, the standardization of ICT has been mostly in the hands of dominant firms or of consortiums with a small number of big international firms, which have *de facto* supported a standardization strategy. To their advantage, forums offer a place where stakeholders are directly represented but with the risk of pushing small or middle-sized players out onto the sidelines. As a consequence, many forms of technology have not undergone classical standardization procedures. Since the primary intention is not to reach a strong, formal consensus established with the representatives of governments, it might seem paradoxical to observe that the same firms both seek international recognition and demand institutionalized standards that, recognized worldwide, will serve as a warranty.

The process is simple: once several operators ply the same market, their business environments collide; and standards have to be made for interoperability. This happened for desktop software a few years ago, when the Open Office XML (OOXML) and Open Document Format (ODF) standards established (for want of full convergence) a common core for interoperability. Legacy formats were thus (finally) made openly accessible. Standardization has, *ex ante* or *ex post*, played an important part in circumstances of this sort. To be convinced of this, we need but recall the development of mobile telephony (in particular the global system for mobile communication, GSM) or of an electronic card payment system based on international standards. Nor should we overlook digital television with the MPEG standards worked out by the Moving Picture Expert Group, a

¹ This article has been translated from French by Noal Mellott (Omaha Beach, France).

working group of authorities from the International Electrotechnical Commission (IEC) and International Organization for Standardization (ISO), whose work was crowned with the Emmy Award in 2017. As for the Internet, several recommendations made by the World Wide Web consortium (W3C) have been incorporated in standards for use by other forums — all of this in response to the urgent need for the interoperability of Web services, including the cloud.

The disruption wrought by the digital transformation

The digital transformation of society relies on three indispensable, inseparable pillars:

- connected devices, which provide a large volume of data;
- the real-time management and processing of data so as to make them easier to understand, improve predictions and advance deep learning; and
- an infrastructure of shared techniques and services that tend to be ubiquitous (cloud services, blockchains, etc.).

To illustrate how digital technology changes the value added by a technique, a use case worth mentioning is driverless vehicles. All this might upend the business models of the firms that make cars or auto parts, evidence of this comes from the consortiums recently formed by automakers and the giant tech firms.

Always attentive to questions about intellectual property rights, standardization can help see to it that the (co)ownership of technical data is duly established. Likewise, connected devices, such as healthware, deliver granular knowledge. Standardization seeks to allow for an unintrusive personalization of services by, for example, making methods more reliable for assessing the processes that make sensitive data statistically anonymous so that they can be used for predictive analytics. Finally, we need to have confidence in the algorithms that are used, especially for artificial intelligence. In addition, questions must be settled about governance so that procedures take into account societal criteria (ethics, transparency, privacy, cybersecurity).

Open source, a form of open innovation

For a few years now, alternative models of producing consensual contents have gradually gained recognition as open-source software (“free” but under different types of licenses). Open source is a very efficient way to establish specifications in noncompetitive areas, such as middleware. Thanks to open source software, cloud computing services have been developed. Amazon was among the first to do so; it created a cloud for its own needs but then commercialized it following a clever advertising campaign. Open-source communities of developers have, thanks to their agility and ability for producing robust technical specifications, turned out to be rivals to consortiums.

In contrast, “voluntary” standardization tends to have benefitted from open source through a formalized process of recognition downstream in the chain of production. A good example is Blockchain: it sprung out of a technical committee (ISO TC 307) that was working on an appropriate terminology, contractual framework and governance for blockchains.

As for smart contracts, which automatically trigger predefined actions when certain conditions are met, standards organizations are trying to evaluate how they could be used as proof before a court. Data-mining practices will probably have to meet requirements related to security and environmental responsibility (by reducing their consumption of energy). Finally, the proliferation of online platforms makes it necessary to reexamine the question of interoperability.

A new form of standardization: Guidelines and codes of good practices

More and more demands are being made for guidelines or codes of good practices related to use cases. To respond to them, it has been necessary to innovate and adapt processes so that they quickly produce pertinent rules, when it is not possible to reach a consensus. A broad, representative set of stakeholders (users, experts, attorneys, etc.) have drafted the guidelines and codes of good practices for helping firms apply the EU's General Data Protection Regulation. These guidelines and codes are complementary to international standards, such as ISO/IEC 29100 on the processing of personal data. The French National Commission on Informatics and Liberty (CNIL) contributed to it.

At the instigation of Reporters without Borders, a nonprofit organization, AFNOR (Association Française de Normalisation: the French Standardization Association), along with its German counterpart (DIN), organized a European workshop for fostering good journalistic practices in reaction to fake news. The media, journalists and online platforms took part in this workshop.

At the instigation of French manufacturers and France Brevets, a CEN Workshop Agreement (CWA) is being finalized on "guidance" for licensing the "standard-essential patents" incorporated in standards for the Internet of things (IoT). Unlike laws and regulations, the standards drafted by international or European standardization organizations might refer to specific patents. The holder of such a patent is to apply FRAND (fair, reasonable, nondiscriminatory) licensing standards.

Extending standardization to vertical sectors and enhanced processes

Standardization concerns all sectors of activity. For example, driverless, connected vehicles will heavily depend on the data used for algorithms. This shift necessarily brings new actors into play, in particular the platforms that serve as intermediaries. We thus observe a collision of business environments: automakers, spare-parts manufacturers, information technology, highway departments, electricity distributors, etc.*

Standardization is accompanying, sometimes anticipating, this change and the disruption of business processes. While existing standards are being adapted to digital technology (*e.g.*, connected breathalyzers), new architectures are being designed so that digital technology is deeply embedded in the complex infrastructure. For instance, BIM (Building Information Model) addresses issues such as the traceability of intellectual property rights for architects, the technical maintenance of buildings, and the appreciation of buildings for investors. As BIM software attracts ever more interest however, the profit that its editors will try to draw from users will have to remain reasonable! A second significant example is smart electricity grids, for which a new architecture (SGAM, smart grid architecture model), designed in Europe, is being proposed internationally.

Standardization is not an easy task in the case of enhanced business processes. For topics (such as cybersecurity) involving a high dose of expertise, each sector of activity might be tempted to draft its own specifications. Whenever more general standards (for several sectors) can be made, economies of scale will be realized, the costs of development and rollout will be more quickly amortized, and generic standards can be completed to deal with specific business processes.

However it might not be worthwhile to transpose current approaches to model-building from one sector to another! Some companies want to export a SGAM-based approach to smart cities in order to enter new vertical markets. This method has, we must admit, limits since the complexity of the issues related to a smart city requires approaches different from those adapted to the management of smart grids. For this reason, adopting standards for smart cities has faltered; and big platforms might impose their proprietary standards (like Google's GTSF). Till now however,

standardization has managed to restrain the proliferation of key performance indicators (KPI) and retain only the information services that urban agglomerations can actually put to use.

Standardization efforts for an “industry of the future” are focused on an architecture backed by big industrial firms. This approach can probably not deal with all the needs related to use cases in connected industries. The architectures proposed as benchmarks have to be harmonized, a task recently taken on by a joint ISO/IEC work group. A standard will bring both the necessary degree of technology neutrality and of interoperability (along the chain or between sectors).

Inspiring confidence in the market without restraining uses

In Europe, standardization is a means for harmonizing public policies in the regulatory framework of the “New Approach”. It defines the requirements for compliance with regulations. Although most standards on digital technology are international, one standard provides a technical framework related to the EU’s eIDAS requirements about electronic identification, authentication and trust services (a regulation that ensued from the 1995 directive on electronic signatures).

One of the options for electronic invoices standardized by Europe uses the PDF-A format, an ISO standard about the characteristics documents have to have to serve as proof in courts of law. This ISO standard grew out of a variant on the familiar PDF-format designed by a well-known software editor.

The acceptability of technology

The digital transformation has a major impact on society. Interactions between machines and people will grow in the coming years, whence major questions about reliability, transparency and traceability — and about making machines (and their algorithms) behave in ways that are ethically acceptable. New standards will probably be drafted for uses that “comply by design” with society’s principles.

As has happened with the GDPR, standards and the standardization process are an efficient vector for raising our awareness and diffusing worldwide a consensual, pragmatic, European view of good practices, which respect individuals, their expectations and rights. Such guidelines will not only build lasting confidence in the uses of digital technology but also keep dominant firms from surreptitiously appropriating key data so as to reinforce their dominant position and capture most of the value added by sectors that are less aware of the risks.