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Volume 25, numéro 3, 2021

URI : <https://id.erudit.org/iderudit/1079216ar>

DOI : <https://doi.org/10.7202/1079216ar>

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Éditeur(s)

HEC Montréal
Université Paris Dauphine

ISSN

1206-1697 (imprimé)
1918-9222 (numérique)

[Découvrir la revue](#)

Citer cet article

Rouquet, A. (2021). The Standards Association: A Hybrid Governance Structure Between Market and Network. *Management international / International Management / Gestión Internacional*, 25(3), 115–131.
<https://doi.org/10.7202/1079216ar>

Résumé de l'article

Depuis le début du XX^e siècle, de nombreuses associations de standardisation ont vu le jour. L'objectif de cet article théorique est de démontrer que l'association de standardisation est une structure de gouvernance et de positionner cette entité au sein de la théorie des coûts de transaction. Une association de standardisation est définie comme toute organisation formelle mise en place pour développer des standards. Sa logique de fonctionnement est pour les associés de concevoir des standards communs, puis de faire de leur adoption un critère pour conclure une transaction. L'article montre qu'elle est une structure hybride entre le marché et le réseau.

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ABSTRACT

Since the beginning of the 20th century, many standards associations have emerged. The purpose of this theoretical article is to demonstrate that standards associations can be seen as a governance structure, and to position this structure in the transaction cost theory. A standards association is defined as any formal organization set up to develop common standards. The operating logic of the standards association is for associates to design common standards, and then to make the adoption of these standards a criterion for entering into a transaction. The article shows that it is a hybrid structure between market and network.

Keywords: association, standardization, governance structure, transaction cost

Résumé

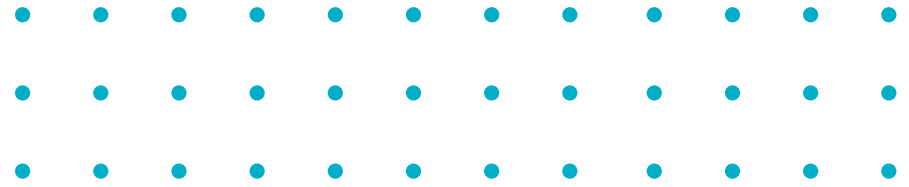
Depuis le début du XX^e siècle, de nombreuses associations de standardisation ont vu le jour. L'objectif de cet article théorique est de démontrer que l'association de standardisation est une structure de gouvernance et de positionner cette entité au sein de la théorie des coûts de transaction. Une association de standardisation est définie comme toute organisation formelle mise en place pour développer des standards. Sa logique de fonctionnement est pour les associés de concevoir des standards communs, puis de faire de leur adoption un critère pour conclure une transaction. L'article montre qu'elle est une structure hybride entre le marché et le réseau.

Mots-Clés : association, standardisation, structure de gouvernance, coût de transaction

Resumen

Desde principios del siglo XX, han surgido muchas asociaciones de estandarización. El objetivo de este artículo teórico es demostrar que este tipo de entidades son estructuras de gobierno, y ubicar la entidad en el seno de la teoría de los costos de transacción. Una asociación de estandarización es cualquier organización formal establecida para desarrollar estándares. Su lógica operativa parte del diseño de estándares comunes, que luego la adopción de estos estándares sea un criterio para concluir una transacción. El artículo muestra que es una estructura híbrida entre mercado y red.

Palabras Clave: asociación, estandarización, estructura de gobierno, costo de transacción

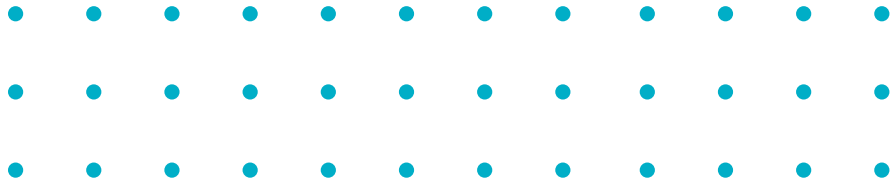


Transaction cost theory (Williamson, 1975; 1985; 1991) is one of the most influential organization theories. Based on the work of Coase (1937), it operates on the assumption that all transactions between agents engender costs. Depending on the nature of the transaction, the theory suggests that agents must adopt different governance structures. Williamson (1975) initially proposed that the choice was limited to the market or the hierarchy. Following several authors [e.g. Miles & Snow, 1986; Thorelli, 1986; Jarillo, 1988; Powell, 1990; Jones *et al.*, 1997], he recognized the existence of a third generic structure: the network. More recently, Demil and Lecoq (2006) have shown, based on the open source case, that the bazaar is a fourth governance structure. Besides those generic structures, the literature also stresses the existence of several hybrid structures (Williamson, 1991), covering a wide range of arrangements: long-term contracts, franchises, joint ventures, etc.

In the landscape of governance structures of transaction cost theory, *no a priori* place has been made for one type of entity: the standardization or standards association. A standards association is any formal organization set up by agents to develop common standards. The standards an association designs are unusual rules in that they are non-binding; the members of the association are free to adopt them (Brunsson & Jacobsson, 2000). When applied by a critical mass of members, standards often tend to impose themselves, due to the existence of increasing returns on adoption (Arthur, 1988) linked to network externalities, which lead to a “snowball effect” (Foray, 2002). By providing information, comparison, interoperability and quality functions (David, 1987), they then allow associates to reduce their transaction costs (Tassey, 2000). Specifically, the operating logic of a standards association is for associates to design common standards, and then to make adoption of such standards a criterion for entering into a transaction. The standards association thus leads to the defining of a set of associated agents within the market, from which each is then free to choose in order to compose and recompose his network, since the specific investment in standards can easily be redeployed to the other partners. If firms isolated or grouped in a consortium can impose their standards (Farrell & Saloner, 1988), the standards association can be seen as the most sophisticated mode of standardization organizing. Indeed, such a structure aims to organize in a lasting manner – between the agents who join together – the design of standards on various subjects. It is a form that counts and yet has been little studied (Lawton *et al.*, 2018).

The purpose of this article is to demonstrate that standards associations can be seen as a governance structure, and to position this among existing structures as a hybrid between market and network. This theoretical article is based on the vast literature that has emerged in recent years on standards organizations [e.g. Farrell & Saloner, 1988; Tamm-Hallström, 2000; Boström, 2006], standardization [e.g. David, 1985; Brunsson & Jacobsson, 2000; Gereffi, *et al.*, 2005], and associations [e.g. Moore, 1996; Gulati *et al.*, 2012]. The article uses existing theoretical components to construct an ideal type (Weber, 1978) of standards association, which accounts for the broad lines of this governance structure. This type of theoretical approach is frequently used to introduce and describe governance structures (Powell, 1990; Williamson, 1991). Nevertheless, it may be noted here that our knowledge of standardization associations is not only theoretical, but is also based on a three-year immersion at an automobile standardization association. In this context, our theoretical development is based on abductive reasoning (David, 2000; Dubois & Gadde, 2002). As a standards association such as the automotive association is an undescribed entity in transaction cost theory, we seek here to show that it certainly could be positioned as such. As part of our abductive reasoning, in order to position this structure in the theory of transaction costs, we will use both theoretical elements and outcomes from the automotive case.

This article is organized into five sections. The first highlights the rise of standards and standards associations in the 20th century. The second section describes how standards associations are used to govern transactions in the automotive industry. The third shows that standards associations such as the one that operates in the automotive industry have the properties of a governance structure. It is based on a specific type of contract – the contract of association – which forms the basis on which agents work together. The efficiency of the structure depends on the standards developed, which enable the associates to reduce their transaction costs. The fourth section compares the standards association with other governance structures. Due to the open nature of the association and the low levels of investment required to become associates, this structure is an appropriate way to reduce transaction costs among a large number of agents. The association’s democratic decision-making process, and the non-mandatory nature of the standards it produces, make this structure relatively unconstraining. These characteristics position the standards



associations such as those in the automotive industry as a hybrid structure between the market and the network. Finally, the fifth section proposes research avenues for further study of standards associations.

The Rise of Standards and Standards Associations

Standards associations are one of several ways of developing standards, that is, rules that have the characteristic of being non-binding and voluntary. While the need for standards has increased as a result of globalization and technological innovation, this method of designing standards experienced a boom in the 20th century, on the initiative of states, businesses, and professions.

Standards Associations: Developing Non-Mandatory Rules

By definition, standards associations develop standards, a term which should be defined precisely, in particular because in English it refers to a double acceptance. On the one hand, from a *normative* perspective, the standard designates what should be, and qualifies a “*convention or code of practice, such as distributing alternating current at 110 volts or transmitting it at 60 hertz*”; on the other hand, from a *positive* perspective, the standard refers to what is and designates a “*technology or method or code that comes to dominate – that becomes ‘standard’*” (Arthur, 1988, p. 591). By standard, we understand it in the sense of Brunsson and Jacobsson (2000) as any set of formal rules, which prescribe to agents how to face a situation, and issued by an actor not having the legal authority to apply them. In the family of rules, a standard differs from a directive, which designates any formal rule that a State or a hierarchy has the authority to issue and enforce through a system of sanctions. It is also to be distinguished from the social norm, which qualifies any rule that is not formalized and often internalized by agents. In a context where they have no legal authority, the issue for actors who promote a standard consists of ensuring that these rules are gradually used by agents and can, in a positive sense, be described as “standard”.

It should be noted that such a definition differs somewhat from that adopted in the literature of economics and innovation technology. The authors (P.A. David & Greenstein, 1990) distinguish “*de facto*” and “*de jure*” standards. “*De facto*” standards designate rules followed widely by agents, whether generalized without any support, in which case we speak of “unsponsored standards”, or whether one or more agents have sought to impose them, in which case we

speak of “sponsored”. “*De jure*” standards designate rules issued by recognized entities, either having been made mandatory by the authorities, in which case we speak of “mandated” standards, or standards which firms have defined together, in which case we speak of “agreements”. Thus, our definition excludes mandated standards, which seem to fall into another category. With the presence of an authority capable of enforcing it, the question of whether or not the “standard” will become “standard” no longer arises. Thus, “mandated” standards seem rather to fall under the concept of “regulation”, where only “lobbying” (Dahan, 2003) can allow firms to influence the process. Obviously, from a dynamic point of view, a rule may very well at some point be a non-mandatory standard, and later if a State decides to make it mandatory, becomes a regulation. In France, AFNOR sets a large number of standards, but only a small number are made compulsory by the State.

Different Actors at the Origin of Standards Associations

As noted by numerous authors (Russell, 2005; Brunsson *et al.*, 2012), the first standards associations appeared at the end of the nineteenth century. Three types of actors in particular contributed to their development: States, industries and professionals. Sovereign States first developed standards associations to regulate technical problems using outside expertise (Russell, 2005). In 1887, the German government created the German Imperial Institute of Physics and Technology for defining electricity standards (Cahan, 1989). Similar structures were established in other countries (Russell, 2005): the British National Physical Laboratory in the U.K. in 1899; the American National Bureau of Standards (NBS) in the U.S. in 1901. In parallel with national governments, firms also founded sector-based associations. At the end of the nineteenth century, the rail companies set up associations to resolve technical issues faced by the industry (Usselman, 2002). In 1972, the U.S. food and retail industry set up the Uniform Grocery Product Code Council (UGPCC), to standardize product coding. Finally, professionals developed standards associations (Russell, 2005) as a means of institutionalizing their professions (DiMaggio & Powell, 1983; Quack, 2007). By the end of the nineteenth century, engineers had founded numerous associations (McMahon, 1984), such as the American Society of Mechanical Engineers (ASME), with Frederick Taylor as its president (Sinclair, 1980). Accountancy associations (Richardson, 2011) also developed standards that became essential for firms.



Globalization led to the appearance of international associations, which often took the form of unions between existing national associations (Brunsson & Jacobsson, 2000; Russell, 2005). The best-known example is the International Organization for Standardization (ISO), created in 1946 on the initiative of 25 national associations. The ISO is an official international association, with 168 members. In retail, several national associations also joined together in 1997 to form GS1, which today comprises around a hundred national associations. Some associations were also set up directly at the international level, such as the Centre for Trade Facilitation and E-business (CEFACT), hosted by the United Nations, which promotes standards for the exchange of electronic data interchange (EDI). This is also the case of the Society for Worldwide Interbank Financial Telecommunication (SWIFT), founded to develop standards for international financial transactions (Brunsson *et al.*, 2012). Finally, in order to develop internationally, some national associations decided to allow non-nationals to become members. This strategy was chosen by the American Society of Mechanical Engineering, which has for some time been open to non-American engineers, and now has 120,000 members in nearly 120 countries (<http://www.asme.org/about-asme>). Table 1 presents the principal standards associations mentioned here.

Standards Associations: The Most Formalized Answer to Setting Standards

As this brief history shows, the rise of standards associations is a response to the growing need for agents to agree on standards. This need stems first from technological innovation, the pace of which has intensified over time (Le Masson *et al.*, 2006). However, when an innovation is in development, multiple development options are open, and agents can make a number of technical choices. It can therefore be interesting for stakeholders to coordinate and collectively agree on common standards in order to avoid investing in a solution that will not ultimately be implemented (Foray, 2002). For example, this is what led the major audiovisual equipment manufacturers and film studios to agree on the DVD standard, in order to avoid the war that had taken place over cassette formats between VHS and Beta (Dranove & Gandal, 2003). It is all the more true since, when a standard imposes itself and becomes generalized, it has long-term structuring effects, as illustrated by the case of the QWERTY keyboard (David, 1985). The need for standards then arises from the internationalization and globalization of trade. While there is no entity globally capable of legally imposing rules upon agents, the only way for agents to organize their relations with each other is often to define standards, the application of which is voluntary (Arhne & Brunsson, 2011). The need to resort to standards is all the stronger given the strategies of firms focusing on their core business (Prahalad & Hamel, 1990) by heavily outsourcing activities, which reinforces the need for coordination and inter-organizational integration firms.

Obviously, a standards association is only one possible strategy for developing and imposing standards. A company, or a group of companies in a consortium, can seek to impose their standards on the market (Farell & Saloner, 1988). If several actors follow this strategy, there can be a battle of standards (Shapiro & Varian, 1999). Such situations arise notably when the standardization stakes are strategic for the firms, and is related to the products or services they sell. The situation is even more complex, since companies can play a double game, and participate in standards association while developing their own standards at the same time. Precisely, some firms participate in the operation of standards associations with the deliberate aim of derailing standards development processes (Foray, 2002). Standardization then becomes part of a cooperative game (Azzam & Berkowitz, 2018), where the players may use various relational

TABLE 1
Different Types of Standards Associations

	State-driven	Industry-driven	Profession-driven
National	<ul style="list-style-type: none"> British Standards Institute (BSI) National Institute of Standards and Technology (NIST) 	<ul style="list-style-type: none"> Global Services 1 France (GS1 France) Global Service 1 United States (GS 1 US) 	<ul style="list-style-type: none"> American Society of Mechanical Engineering (ASME)
International	<ul style="list-style-type: none"> International Standardization Organization (ISO) United Nations Centre for Trade Facilitation and E-business (UN/CEFACT) 	<ul style="list-style-type: none"> Global Services 1 (GS1) Society for Worldwide Interbank Financial Telecommunication (SWIFT) 	<ul style="list-style-type: none"> American Society of Mechanical Engineering (ASME)



sequences (Yami *et al.*, 2015). Among the options for designing standards, however, the standards association is the most accomplished and sophisticated mode in the sense that it involves organising the design of standards repeatedly and over time for different types of subjects.

Standards Associations in The Automotive Industry

Among the many agents having established standards associations, a particularly exemplary case is that of firms in the automotive industry. Beginning in the 1980s, most of the countries where the automobile industry is important possess established associations. These have individually and collectively developed numerous standards which today are widely used in the transactions.

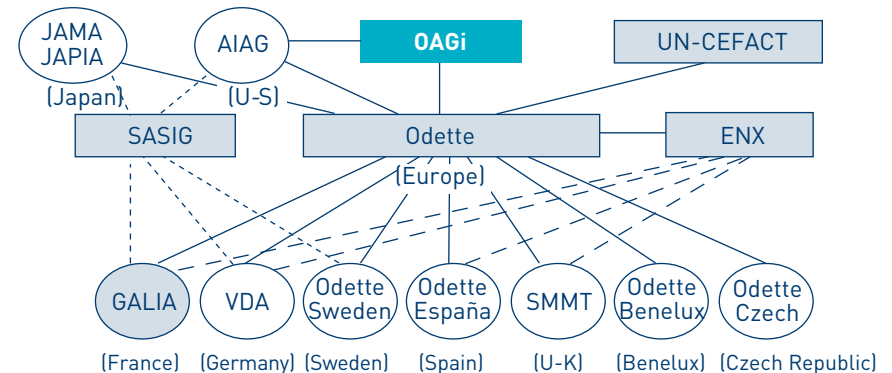
The Multiplicity of Automotive Standards Associations

In the automobile industry, the first country to establish such a structure was the United States. In 1982, the United States set up the Automotive Industry Action Group (AIAG), which now comprises all the automobile and equipment manufacturers operating in the country. This association served as the model for the French “Groupement pour l’Amélioration des Liaisons dans l’Industrie Automobile” (GALIA), set up in 1984 by Renault, PSA and their suppliers. It also inspired other European manufacturers, who in 1984 set up Odette (the Organization for Data Exchange by Tele-Transmission in Europe). This pan-European association brings together the national associations of France (GALIA), Germany (VDA), Spain (Odette Spain), Scandinavia (Odette Sweden), the United Kingdom (SMMT) and the Czech Republic and Slovakia (AIA). Japan has two associations, one for manufacturers Japon (JAMA), and one for suppliers (JAPIA).

In order to develop global standardization, these associations often set up joint projects on a specific subject, in which representatives of national associations participate. More fundamentally, these associations have also sought to develop more formal international structures. For instance, in the 1990s, the American (AIAG), Japanese (JAMA), French (GALIA), German (VDA) and Swedish (Odette Sweden) organizations set up the Strategic Automotive product data Standards Industry Group (SASIG). In Europe in the 1990s, these associations created the European Network eXchange (ENX), with the aim of developing within the continent a network of secure and broadband exchanges. Furthermore, it

should be noted that these associations maintain relationships with inter-sectoral standards associations, such as with the United Nations committee UN-EDIFACT, responsible for the design of global standards in EDI, or with the Open Applications Group (OAGi), founded to develop global cross-sectoral standards in XML (eXtensible Markup Language), in order to facilitate the interoperability of information systems. Figure 1 below shows all of the automotive associations.

FIGURE 1
The standards associations in the automotive industry



The Functioning Inside Automobile Standards Associations

While there are differences between these associations, most of them function according to the following logic. In accordance with their statutes, each association holds a general assembly once or twice a year, where manufacturers and supplier members can control the directions taken by the association, and validate the decisions of its steering committee. This body, which meets several times a year, is responsible for steering the work of the association, and is made up of a dozen representatives elected by the general assembly. These representatives come from manufacturers and suppliers, in order to represent all stakeholders.



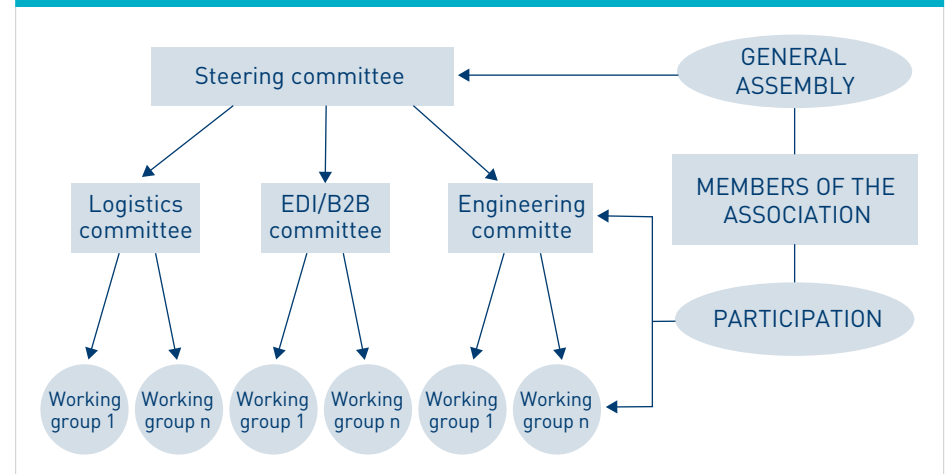
For example, within GALIA, this committee contains representatives from Renault, PSA, but also from Trèves, Michelin, Valéo, etc. The steering committee has authority to approve the standards designed by the association, and to admit and exclude members of the association. His key role is to supervise the actions of the association's executive committee, that is, the permanent staff who manage the work on a daily basis.

This committee is comprised of project managers, assisted by a few administrative staff, and is chaired by a director appointed by the general assembly. Within the permanent staff, each project manager is generally responsible for coordinating one of the three areas in which these automotive standards associations operate: logistics, engineering and B2B / EDI. Each of these areas is more generally managed by a functional committee, which regularly brings together a dozen member representatives. These come from both manufacturers and suppliers, and contain specialists in the field under consideration (logisticians for the logistics committee, etc.). Chaired by one of the representatives elected by his peers, the mission of each functional committee is to: 1) supervise standardization work in its functional area (definition of standards needs, launch of working groups, validation of work); 2) Make the standards compatible with the tools of service providers; 3) Support the members of the association in the implementation of standards; 4) Define the position of the association in international standardization projects. The internal organization of an automotive standards association has been shown in Figure 2.

The Key Role of Numerous Standards

Since the 1980s, these national associations have conceived numerous national and international standards, either alone or in partnership. Several of these standards are widely used by manufacturers and their suppliers and have become standard in the industry. This is the case for standards linked to Electronic Data Interchange, which allow orders (ORDERS Messages), invoices (INVOICE Messages) and dispatch notices (DESADV messages) to be transmitted in an automated and computerized manner between industry actors (with a coverage of 99% of the transactions among manufacturers and tier 1 suppliers). This is the case with many logistical standards: for identification, with labeling standards of various sizes which allow products and packages to be identified; for packaging, defining a range of cardboard standards of different sizes, as well as reusable

FIGURE 2
Organisation of standards conception in the automotive industry



standards for widely deployed plastics or metals; for logistics assessment, through service measurement standards and a global logistics audit standard, called Global Evalog, used to assess their suppliers by Renault, PSA, Volvo, Ford, Daimler, General Motors. This is finally the case for several engineering standards, such as the Standard for the Exchange of Product Model Data (STEP), which allows the representation of product data, or Product Data Quality (PDQ), which makes it possible to assess the quality of product data, which are essential for vehicle co-design between manufacturers and suppliers.

While their degree of diffusion may vary according to country, each automobile manufacturer has implemented a significant number of those standards. As a consequence, all together, the standards developed by this system of standards associations play obviously a key role in the transactions within the automotive industry. Indeed, the majority of manufacturers and large equipment manufacturers make the adoption of a number of these standards a prerequisite for becoming their suppliers. If a company is not able to send EDI messages, use



packaging and labeling standards, get a good evaluation from the Global Evalog standard, etc., it will not be selected as a supplier. Though they are forced to use them in order to contractualize with the main dominant players in the industry, the advantage of these standards for suppliers is that they can be redeployed to several customers. The suppliers can thus use them in a large part of the supply relationships they establish. Given the number of standards developed, it must be noted that standards associations play a central steering role, in the sense that they make it possible to manage this system of standards over time. They check the compatibility of the standards that are developed between them, publish updated versions of certain standards, and when a new need arises, launch new projects.

Standards Associations As Governance Structures

In order to prove that standards associations like those at work in the automobile industry constitute a governance structure, the challenge is to demonstrate that a standards association possesses the three features characterizing such entities (Williamson 1991), that is to say: 1) is based on a contractual arrangement; 2) has at its disposal instruments for transaction governance; 3) provides a response to the issue of economic adaptability. As we will see here, this is certainly the case with standards associations, which according to their characteristics can be compared to the three generic structures identified by Williamson (Table 2).

The Contract of Association as a Contractual Regime Between Agents

Legally, the standards association is based on a contractual arrangement between its members. What defines the formal existence of any association between agents is the fact that they jointly adhere to a series of rules, recorded by the association in its “statutes”. These statutes make the association a legal entity, and their role is to clarify the rights and responsibilities of the contracting parties. For instance, the statutes of GALIA require the associates to contribute to the life of the association through financial, material or human contributions, and in exchange make the standards developed available to the members. They also detail how the association takes decisions related to the setting of standards. In this context, the contract of association appears to be based on a democratic approach (Knokke & Prenskey, 1984; Tamm-Hallström, 2010). Indeed, standards

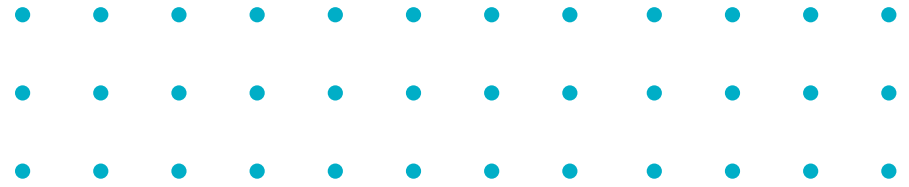
TABLE 2
Distinguishing Attributes of Market, Standards Associations, Network and Hierarchy Governance Structures

Attributes	Governance Structure			
	Market	Standards Association	Network	Hierarchy
Instruments				
Incentive intensity	+++	++	+	0
Administrative controls	0	+	++	+++
Performance Attributes				
Adaptation (A)	+++	++	+	0
Adaptation (C)	0	+	++	+++
Contract law	+++	++	+	0

*+ ++ = very strong; ++ = strong; += semi-strong; 0 = weak (adapted from Williamson, 1991)

associations give all members equal powers, and provide for consensual decision making (Boström, 2006; Fransen & Kolk, 2007; König *et al.*, 2012; Simcoe, 2012). The fact that each member has a voice does not signify that within the association some actors are not more powerful than others. In each association, some dominant actors can be identified, and they are key actors to convince for standardization processes to succeed. Within GALIA, the manufacturers thus have two seats each on the board of directors, unlike all the suppliers and equipment manufacturers, who have only one. In accordance with this democratic approach, the members are free to choose whether or not to belong to the association (Knokke & Prenskey, 1984).

With these features, the contract of associations applies equally to all agents who wish to become partners and is a contractual arrangement where the identity of the contracting parties is of little importance. Furthermore, the interdependence of the stakeholders is low, because the members are often numerous, and the association is voluntary (Knokke & Prenskey, 1984).



Interdependence is even lower given the fact that membership is often annual, meaning that some members often join or leave from one year to the next. Moreover, an agent can join the association, but not get involved in the work. Within the automobile associations, a large number of members simply pay their annual membership fee, which does not represent much, without their taking an active part. As the statutes are used to resolve conflicts between associates, the association is a structure in which contractual rules play an important role. The association's contractual regime is however limited in several ways. Firstly, the contract of association is not open to all. An agent who wishes to join an association has to show that he is in some respect similar to the other associates: from the same country, the same sector, the same profession, etc. (Ahrne & Brunsson, 2008). Secondly, the mechanism used to resolve conflict is in this case a vote by the associates, which is in line with the democratic approach taken by associations (Boström, 2006; Fransen & Kolk, 2007). However, such a mechanism is fairly limited in scope in the sense that it is never possible to compel an associate to adopt a standard. Moreover, rather than coming to a vote, associations tend to seek consensus, and in the automotive industry, only in rare exceptional cases is such a process put in place. This willingness to seek consensus can lead to time-consuming decision-making processes (Simcoe, 2012).

Standards as an Instrument of Transaction Governance

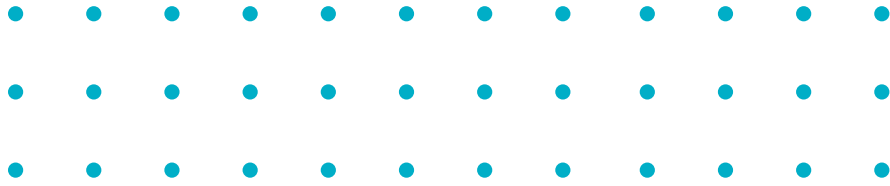
The major instrument on which standards associations rely is, of course, standardization. Such an instrument is quite strongly incentive-driven, but features fairly low levels of administrative control. This high level of incentives results from the fact that standards are by definition instruments of comparison (David, 1987; David & Greenstein, 1990). They facilitate the establishment of hierarchies between agents (Brunsson & Jacobsson, 2000): those who have adopted the standards and those who have not; those who apply the standards well and those who apply them badly, and so on. It is thus very easy for agents to make adherence to standards a condition for market access (Brunsson *et al.*, 2012), which gives their suppliers a strong incentive to adopt them. In numerous sectors, and as the automobile industry illustrates, customers demand that their suppliers use standards, such as those concerning quality (Guler *et al.*, 2002) or the environment (King *et al.*, 2005). The power of standards as incentives is also based on the fact that they enable compatibility and interoperability

(David & Greenstein, 1990). The adoption of a standard thus enables an agent, by means of an unspecified investment, to connect with all other agents who have adopted it (Fabbe-Costes *et al.*, 2006). One drawback is the fact that certain standards raise barriers to market entry, which might discourage new players and limit competition (Porter, 1985).

Whilst standardization is a strong incentive, its administrative intensity is relatively weak. The adoption of standards is, by nature, voluntary, and not based on authority (Brunsson & Jacobsson, 2000). Thus, several authors see standards as a *soft law*, which is difficult to oblige actors to follow (unless associated with market forces), and whose correct application is very difficult to verify. A great number of studies have shown the strong decoupling (Meyer & Rowan, 1977) that can exist between the standards that agents declare they use, and their actual use of such standards. Even more than in the case of internal hierarchical rules, organizational hypocrisy (Brunsson, 1989) appears to be prevalent in the field of standards, whether these concern the environment (Boiral, 2007; Carmagnac & Carbone, 2018), accounting (Jamali, 2010), or quality (Boiral, 2012), etc. The automotive industry is no exception to this hypocrisy, and many suppliers claim, for example, to have excellent performance on the Global Evalog logistics evaluation standard, with a view to securing their relationship with their manufacturer customers, when in reality their logistics performance is mediocre. When organizations want to check whether standards are correctly implemented, they can, however, call upon certification bodies (Terlaak, 2007).

The Standards Association as a Response to the Issue of Adaptability

The standards association responds to the adaptability problem principally through type A adaptability (which consists of agents making autonomous change), but also to a lesser degree through type C adaptability (which consists of agents reacting to changes in a coordinated manner). The high level of type A adaptability in the standards association results from the fact that the value of a standard, through the existence of network externalities (Katz & Shapiro, 1985), depends not so much on its features as on the size of the network in which it is used (Arthur, 1988). Thus, the advantage for an agent of adopting a standard varies directly with the number of users of the standard. In the automotive industry, as soon as several manufacturers start simultaneously adopting and deploying a standard, a large number of suppliers do the same, because they know that they will be



able to deploy it to several of their customers. Due to this fact, variations in the number of users of a standard, by strengthening or weakening its value, lead agents to adapt without needing to coordinate their actions (Foray, 2002).

To a lesser extent, the standards association also leads to type C adaptability, which results from the association itself. This structure organizes coordination between the associates and, when the associates are exclusively organizations, is similar to a meta-organization (Ahrne and Brunsson, 2008; Gulati *et al.*, 2012). However, such an entity has only a small number of traditional organizational instruments, which makes it only a partial organization (Ahrne & Brunsson, 2011). One consequence of this is the likelihood that it will demonstrate a great deal of inertia and therefore react slowly to environmental changes (König *et al.*, 2012). In the automotive industry, standardization projects often last several years and come to nothing, so the success rate of standards projects is merely average. Despite its weakness, the structure appears essential for governing two crucial stages of standardization processes. The first of these is the definition of standards, in the sense that the existence of an association to coordinate action between agents can enable them to commit very early on to a common standard project and ultimately avoid a battle of standards (Shapiro and Varian, 1999). Battles of standards represent a significant cost and make the actors who engage in the battle take a very significant risk. This is linked to the fact that often a

single standard is imposed at the end because of network externalities (Foray, 2002). The second crucial stage is that of changes to or the replacement of standards, which can require coordination between agents (Fabbe-Costes *et al.*, 2006) because of the existence of lock-in effects (David, 1985; 1987). An important part of the activity of automobile associations is thus the updating of certain standards that are widely used (EDI, packaging, labelling), in order to take into account elements such as feedback from members, technological developments, or the appearance of a new need that had not initially been taken into account.

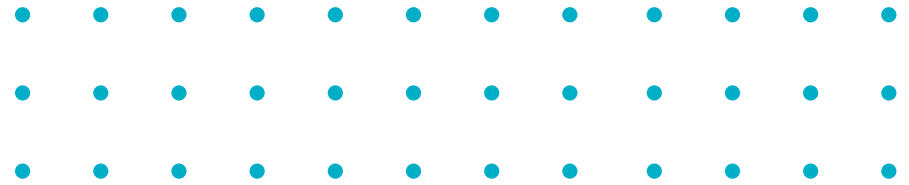
Standards Associations: A Hybrid Structure Between Market and Network

Whilst standards associations like those in the automobile industry possess the attributes of governance structures, these need to be positioned with regard to the existing structure. As the difference between a hierarchy and standards association is obvious, we compare the standards association with the other two main generic governance structures identified in the literature: the market and the network. This comparison shows that standards association can be seen as a hybrid between market and network. Table 3 summarizes the differences between those structures.

TABLE 3
Stylized Comparison of Forms of Governance Structures

	Market	Standards Association	Network
Normative basis	Contract – property rights	Association – Interoperability	Complementary strength
Means of communications	Prices	Standards	Relational
Methods of conflict resolution	Haggling – enforcement by courts	Democratic – Voting Procedures	Norm of reciprocity – Reputational concerns
Degree of flexibility	Very high	High	Low
Amount of commitment among the parties	Very low	Low	High
Tone or climate	Precision and/or suspicion	Community of interest	Open ended-mutual benefits
Dependency	Very low	Low	High

[Adapted from Powell, 1990]



Market And Standards Associations

There are some obvious differences between market and standards associations. In a pure market structure, coordination between the agents is based on prices, which is the one and only variable in decision making and alignment. In the market, the identity of the contracting agents has no importance (MacNeil, 1974), and they are independent from each other. A pure market structure allows a great degree of flexibility; agents can change partners freely as supply and demand fluctuates (Williamson, 1991). Because of this, mutual commitment is very low, and the contracting parties are motivated merely by their own financial interests. This causes the tone of the transaction to be one of suspicion and mistrust (Powell, 1990). Finally, when conflict arises, it generally has to be resolved using legal mechanisms, which in this case play a fundamental role (Williamson, 1991).

Unlike the market, the standards association is not based on pricing coordination, but on standards sharing, which is key to gaining admission to this structure (Brunsson *et al.*, 2012). Accordingly, the identity of the actors is not without importance; the transaction necessarily takes place between associates who have adopted the standards. The standards association thus appears less flexible than the market, since flexibility can only be obtained by replacing one associate with another. For example, a car manufacturer will tend to replace one supplier with another that has already implemented the main standards in force in the industry, so as not to waste time training the new supplier in such standards. Moreover, such a structure requires a minimum of commitment on the part of the agents (Knokke & Prensky, 1984) in the sense that the members accept the association's rules and finance it. Furthermore, the relationship is not one of mistrust as in the market, but of defending shared interests; the role of an association is to promote the collective interests of all its members as a community (Moore, 1993; Carmagnac and Carbone, 2018). This community dimension is strengthened when there are several national standardisation associations, as in the case of the automotive industry, in the sense that each tends to work primarily for the defence of its national members. Of course, the fact that the association defends the interests of the community does not prevent the fact that certain members can continue to pursue their own interests, as illustrated by the firms who play a double game by participating in standards associations while seeking to impose their standards (Foray, 2002). Finally, conflict resolution takes place via democratic mechanisms which are, as mentioned, an essential part of the

structure (Boström, 2006; Fransen & Kolk, 2007; Simcoe, 2012), even if, as in the case of the automobile industry, voting is a little-used last resort.

Network And Standards Associations

Whilst there are clear differences between market and standards associations, the distinctions between network and standards associations are subtler. As defined in the literature, relationships between stakeholders in a network are based on long-term contracts (Williamson, 1991; Jones *et al.*, 1997). The network implies a fairly strong commitment on the part of the stakeholders to make the links they establish long-lasting. The network is also based on the complementary nature of the members (Powell, 1990). The fact that the members complement each other also develops solidarity between them, since their overall survival depends on the performance of their network (Moore, 1993; 1996; Christopher, 2010). This solidarity in the face of the competition leads to the creation of a climate of trust in exchanges between members (Powell, 1990; Jones *et al.*, 1997). Conflict within the network is regulated by the members' mutual commitment, making it impossible for agents to breach this trust without seriously damaging their reputation and being excluded from the network (Larson, 1992; Jones *et al.*, 1997). Finally, a network-like structure is much more flexible than a hierarchy (Thorelli, 1986), but less so than the market.

Although some of the features of a standards association are close to those of a network, it differs from the latter in several significant ways. Firstly, unlike a network, the standards association is not based on long-term contracts but on a contract of association, which, as in the case of automobile associations, is in general renewed annually. The short duration of the contract is reflected in the much weaker commitment involved than in a network. The lower commitment is due to the fact that agents do not exchange directly with each other in the association – as they do in the network – and the fact that commitment to the standards, though binding, is renewable. Secondly, whilst the network is based on member complementarity, the standards association is based on one technical sub-dimension of this complementarity: interoperability (David & Greenstein, 1990). Indeed, the shared standards enable associates to connect/disconnect with or from each other, making the standards association extremely flexible and dynamic. Rather like with a Lego set (Fabbe-Costes *et al.*, 2006), automobile industry associates having adopted the same standards can link together in an infinite variety of ways. This interoperability is also facilitated by

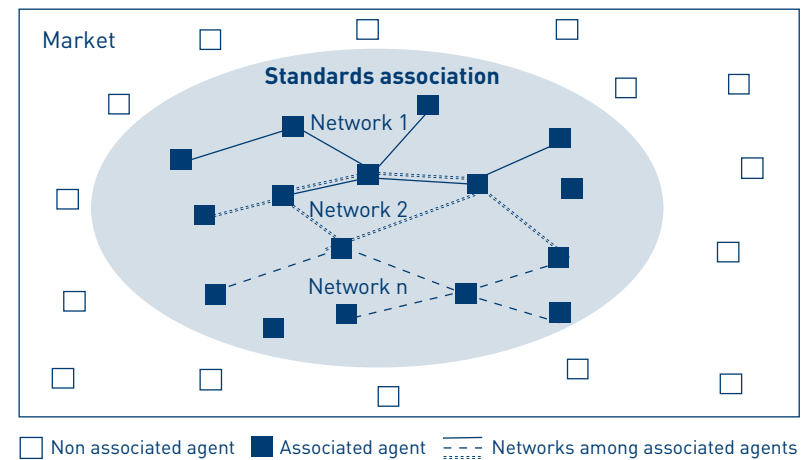


the fact that these entities adopt modular structures of governance (Manning & Reinecke, 2016). The standards association can set up temporary structures (Lundin & Söderholm, 1995) between members who connect together during a single project, and then disconnect in order to reconnect with other associates. In the automotive industry, there is thus a wide variety of associations that have developed over time and whose spheres of action often partly overlap (Figure 1), which makes it possible to develop projects whose scope varies both geographically (national, European, worldwide associations) and thematically (generalist or specialist associations, etc.). The standards association thus encourages the development of latent organizational forms (Starkey *et al.*, 2000), in which the interdependence of the associates is much weaker than in a network. Finally, unlike in a network, which is mostly regulated by mechanisms of reputation and trust, a standards association is based on democratic governance (Knokke & Prenskey, 1984; Brunsson & Jacobsson, 2000; Tamm-Hallström, 2010), promoting the interests of the community (Moore, 1993; 1996; Carmagnac & Carbone, 2018). In fact, members of the automobile associations frequently assert that these structures are useful precisely because they allow them to agree on a common language for the industry, which ultimately facilitates exchanges between everyone and increases the efficiency of the industry.

The Standards Association: A Hybrid Structure to Govern Moderately Frequent Transactions

In view of its characteristics halfway between the market and the network, the standards association can be considered as hybrid structure between these two generic forms (Figure 3). Compared to the market, which operates solely on the basis of prices, the standards association by definition restricts the use of price mechanisms to those members or associates who have implemented the standards. It thus determines a set of agents with whom to potentially enter into transactions from within the vast anonymous market. In relation to the network, which operates on the basis of a precise long-term commitment between certain agents, the association leads to agents engaging with a larger population of members, with whom they can decide to establish ties. The standards association thus defines a larger space than the network since, due to the interoperability of standards, members can maintain several networks within the association.

FIGURE 3
Standards association: a hybrid structure between market and networks



Consistent with such an intermediary position, the standards association is appropriate for governing transactions having characteristics that are in between of those of the market and the network in terms of frequency and specificity of assets (Williamson, 1985). In terms of frequency, in view of the investment required to implement standards, and the risk of a lock-in effect (David, 1985), the standards association appears less appropriate than that of the market for occasional transactions. In the automotive industry, in order to occasionally source general supplies that are not related to the manufacture of vehicles, manufacturers obviously do not use suppliers that have deployed automotive standards. On the other hand, while the network may appear to be appropriate for governing relatively frequent transactions between agents who are committed to long-term relationships (Powell, 1990), the standards association appears to be appropriate for governing less frequent transactions between very large numbers of agents. For example, the existence of widely used standards in the



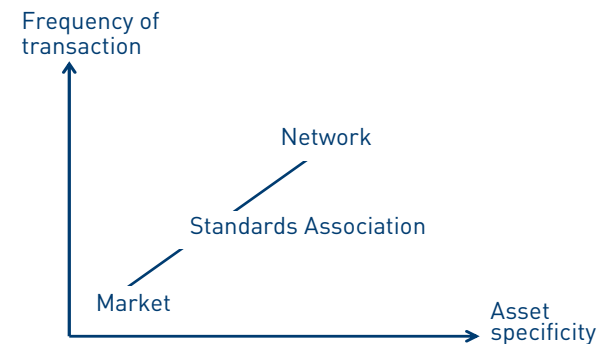
automotive industry means that a manufacturer can regularly change suppliers, because several competing suppliers master the standards necessary for a good supply relationship, and the current supplier can also easily connect to other manufacturers. Concerning the specific nature of the assets, unlike the market association, the standards association requires agents who want to do transactions together to invest in a specific asset: the standards of the association. However, such assets appear less specific than those required in a network, which is based on the development of trust mechanisms (Powell, 1990). Trust is a relational asset, built over the long term; it relies largely on informal social norms and develops through interpersonal relations (Bradach and Eccles, 1989). Such features mean that these assets may only be deployed among a small number of agents, and are difficult to redeploy in contexts other than the network. This is not the case for assets developed for the association: standards like those developed in the automobile industry take the form of formalized, general rules, and can easily be deployed by a large number of agents (Brunsson & Jacobsson, 2000). Thus, once an agent has adopted a standard, the agent can redeploy the investment in relationships developed with any other agents associated (Arthur, 1988; Fabbe-Costes *et al.*, 2006). Such assets are thus not very specific, since they are, as is the case with specific automotive standards, on a very broad industry scale.

Conclusion: Further Research on Standards Associations

In this paper, we demonstrate that the standards association, like those in the automobile industry, constitutes a hybrid governance structure between the market and the network. While this article is a first step to understanding these entities as a governance structure, several questions remain to be explored. First, monographic research must be carried out on standards associations in order to enrich the typically idealized vision of their governance proposed here. Second, it would be interesting to see whether or not it is possible to compare standards associations side by side, and to position them according to type on a market-to-network continuum. Finally, it would be relevant to study how in reality agents use or do not use these structures in complement to other governance structures.

FIGURE 4

Appropriateness of Market, Standards Association, Network and Hierarchy Governance Structures



What Governance in Practice for Standards Organizations?

In this article, we have proposed a typically idealized vision of the governance of standards associations, such as the ones that operate in the automotive industry. In line with this approach, we have emphasized the features of such a structure (Weber, 1978). However, in future work, using in depth case studies, it will be necessary to study the actual functioning of other standards associations. On the one hand, it would be interesting to deepen our analysis of the type of governance rules used by these entities, which can vary widely. If, as we have pointed out, these rules are democratic, there is a specific tension between this logic and that of effective action. If the majority of an association approves a standard, but the most powerful agents of the association vote against it, it is clear that the standard is unlikely to prevail. Consequently, the logics of democracy and efficiency are sometimes contradictory (Courret, 2006), and a major challenge for associations consists of managing to make them coexist. One possible way of doing so seems to be to give additional rights and duties to a certain category of members, especially those who have strong power. What other rules and mechanisms exist within such associations to manage such tension? Instrumentally-speaking, what further rules and devices can be invented?



In addition, it would be interesting to analyze in detail the tensions within a standards association during standardization processes. If the association is there to promote the collective interest of the partners, certain member agents may indeed, as mentioned above, pursue their own interest. Thus, it would be interesting to use approaches in terms of cooptation (Bengtsson & Kock, 2000; Le Roy & Yami, 2007) to see how associations manage the coexistence between their members of logics that are sometimes cooperative, sometimes competitive. In this context, what strategies do standardization associations use to align the interests of all associates with that of the association? In the event of an open and persistent disagreement between several partners on a standards project, should the standardization process be stopped to avoid failure and save time and resources? Or, on the contrary, should the standardization project be continued despite the disagreement of certain members?

Where to Position the Standards Association Between the Market and the Network?

Another point that needs to be further examined, for example, by using multiple case studies, is that of the positioning of the standards association between the market and the network. In this article, we have addressed standards associations as a coherent type between market and network, but in reality, these entities take different forms. Depending on the case, it is thus possible that some standards associations are closer to the market than to the network, and vice versa. For example, national or international standards associations seem to be positioned closer to the market than to the network. Indeed, the standards they offer are developed from an intersectoral perspective, and potentially concern a great deal of agents. In some cases, states can also end up making them mandatory, and these standards then become rules regulating all market transactions. Conversely, some standards associations may appear much closer to the network. This is particularly true of sectoral associations, which develop standards whose scope is sometimes limited to a few large brokers and their networks of suppliers. To position such entities, the challenge is to develop a finer typology of standards associations in order to account for their diversity.

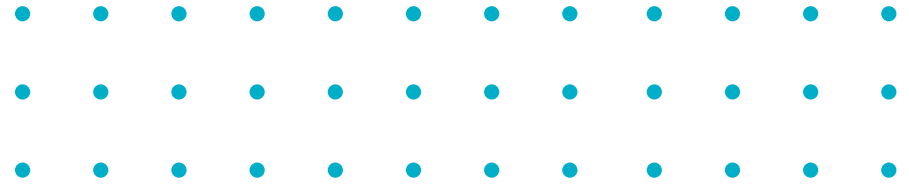
In keeping with the previous point, a question which must also be asked is that of the hybridization possibilities between the standards association and the market and hierarchy. Can we not basically consider that national and international

standardization associations are somehow hybrid structures between market and standards association?? On the other hand, can we not see in the informal consortia-type strategies (Delcamp & Leiponen, 2014), which bring together only a few companies in a less formal way, a hybrid form between a standards association and a network? Beyond these two examples, how can we categorize on a continuum the multiple means (firm, alliance of firms, consortium, association, etc.) that exist in order to develop standards? What explains the relevance of each strategy from the points of view of both the players implementing the strategy and of society more generally?

How Is the Standards Association Used in Conjunction With the Other Structures?

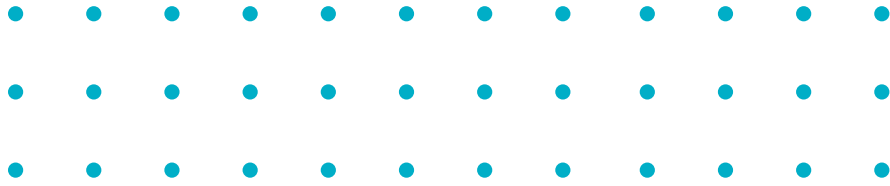
Finally, another avenue for research is that of how standards associations are possibly used with other structures. The contingent nature of governance structures suggests that agents may use each of them simultaneously, depending on the nature of the transactions that they have to govern. The case of automobile manufacturers illustrates this joint use effectively. In the automotive industry, a hierarchy is used to govern transactions occurring within different manufacturing firms, even if they can also be governed using market philosophy (Makadok & Coff, 2009). Commodity purchases of goods not used to manufacture cars (office supplies, machinery, etc.), will very often be governed using market mechanisms (Sturgeon *et al.*, 2008). Finally, stable relationships with tier 1 supplier providing complete subsystems are governed by network mechanisms (Dyer & Nobeoka, 2000). As we have seen here, the automotive actors also use the standards association. How do such governance structures interact? What are the areas of overlap between these structures and what conflicts may develop in these areas? What makes agents switch from one governance structure to another?

While the standards association is less widespread than other structures, it is finally necessary to examine the factors that give rise to such entities. What are the conditions that lead agents to create and implement standards associations? Who in practice are the actors behind the creation of these entities? While several standards associations may be created in the same field, how do standards associations operate amongst themselves? Can there be cooperation between standards associations? Conflicts? What makes standards associations disappear?

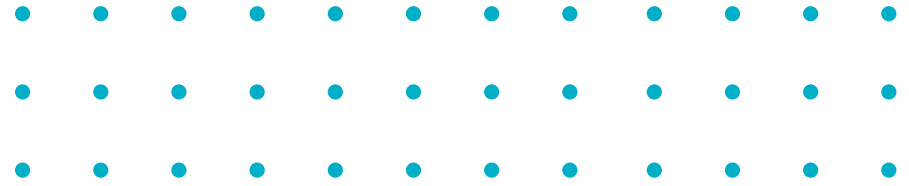


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