

Featured Articles

Construction of a Collaborative Creation Platform

—A New Approach to International Standardization—

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OVERVIEW: The standards required to promote Hitachi's Social Innovation Business are not the technical standards of the past but a new type of standard that applies to services and other societal practices. This in turn requires that international standardization be approached through collaborative creation involving not only technology suppliers, but also a wide variety of stakeholders. This article looks at how this new approach (rule-making standards) differs from how international standards were treated in the past (technical standards), and considers the effect that rule-making standards have on business development. It also presents examples of rule-making standards for which Hitachi is playing a leadership role.

INTRODUCTION

JAPANESE organizations, including Hitachi, has had a long involvement with international and technical standards, with a variety of objectives. On the one hand, there is a need, particularly in the case of corporate activity, for dealing with international standardization as part of a business strategy. Hitachi's Social Innovation Business in particular, because it is characterized by the use of information technology (IT) in social infrastructure to help solve the problems facing society, requires a completely different approach to that of businesses that sell consumer products.

This approach involves looking at things from a user's perspective, rather than a technology supplier's perspective, and this means undertaking development jointly with "customers," which in this context includes investors and government officials. This corresponds to Hitachi's concept of "collaborative creation."

This article describes the author's experience as a leader in international standardization together with examples and example problems, and seeks to explain, in as intelligible a form as possible, the ways in which international standardization can be utilized in business.

ORIGIN OF INTERNATIONAL STANDARDS

Before considering their relationship with business, the article will first look at the World Trade Organization (WTO) to review what "international standards"

actually are. The WTO's agreement relating to technical trade negotiations is commonly referred to as the Technical Barriers to Trade (TBT) Agreement. In accordance with the basic principle that industrial and other product standards, and the procedures for assessing compliance with those standards, should not create unnecessary barriers to international trade, Article 2 of the WTO's Agreement on Technical Barriers to Trade stipulates that central government bodies shall use international standards as the basis for technical regulations.

In this context, what is meant by an "international standard"? One definition is found in section B "Decision of the Committee on Principles for the Development of International Standards, Guides and Recommendations with Relation to Articles 2, 5 and Annex 3 of the Agreement" of the Annexes to Part 1 in the document of resolutions, G/TBT/1/Rev.10. This section specifies the following conditions called the six principles for international standards.

- (1) Transparency
- (2) Openness
- (3) Impartiality and consensus
- (4) Effectiveness and relevance
- (5) Coherence
- (6) Development dimension

The International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), and International Telecommunication Union (ITU) are also expected to satisfy all of these principles (see Fig. 1).

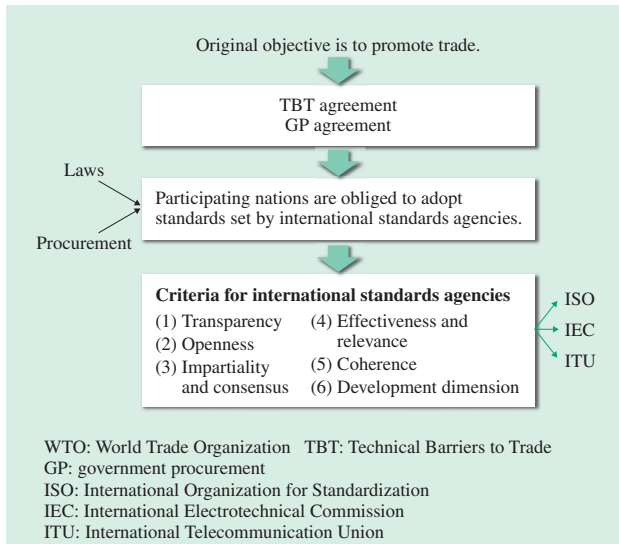


Fig. 1—International Standards and the WTO. The WTO requires international standards to comply with six principles.

However, the same standard can be divided into two types, namely technical standards and rule-making standards.

Technical standards are defined in Japan by Article 2 of the Industrial Standardization Act as including such things as the type, model, figure, dimensions, quality, performance, production or design methods, analysis, terminology, units, and measurement methods for industrial products, as well as the design and construction methods and safety criteria for buildings.

When actually reading the text of these standards, it often takes the form of stipulating that products must satisfy some particular criteria. Accordingly, standards of this type always raise fears of disclosing

a company’s know-how relating to its own products. It is fairly common for the company staff involved in the development and sales of products to hold a poor opinion of standards, and this fear likely contributes to this poor opinion.

This situation does not apply, however, to rule-making standards. In the case of international standards in particular, the number of standards of this type has been increasing in recent years. These standards stipulate the form that business practices and services should take, something that is not included in the standards for industrial products. Well-known examples of management system standards such as the ISO 9000 and ISO 14000 series can be thought of as amongst the first standards of this type. The text of these standards tends to take the form of stipulating what actions organizations must take, what criteria services must satisfy, and how society should organize itself.

Nowadays, the international standardization process involves developing and publishing both types of standards together. However, this article will focus primarily on rule-making standards. This is because, as explained below, these standards hold the greatest potential for utilization in business.

RETHINKING STANDARDS FROM A BUSINESS PERSPECTIVE

This section describes how international standards are thought of at companies. Based on the author’s experience speaking with staff at Hitachi and elsewhere, the most common way of thinking about international standards is that represented by Fig. 2. As shown in the figure, the default attitude when considering business activity separately in terms of its profitability and of its contribution to society, is obviously to see profitability as the key consideration, and contribution to society as an offshoot to that.

Competitiveness plays an important role in this way of thinking, with patents emerging as an effective way of securing competitive advantage. On the other hand, standards fall under the category of those activities aimed at the public good, as offshoots of the consideration of contributing to society and are associated with the idea of the widespread dissemination of know-how. Looked at in this way, international standards do not appear to offer effective opportunities for their use in business.

Consider the following hypothetical example involving a company (“Company A”) that sells high-

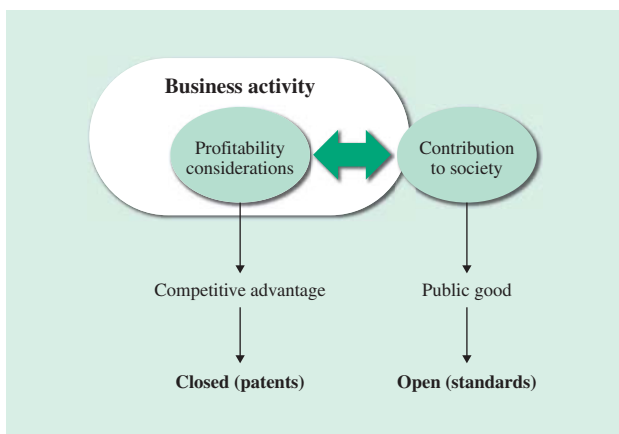


Fig. 2—Conventional Way of Thinking about Standards. Standards have been thought of more as a public good, rather than as a pathway to profitability.

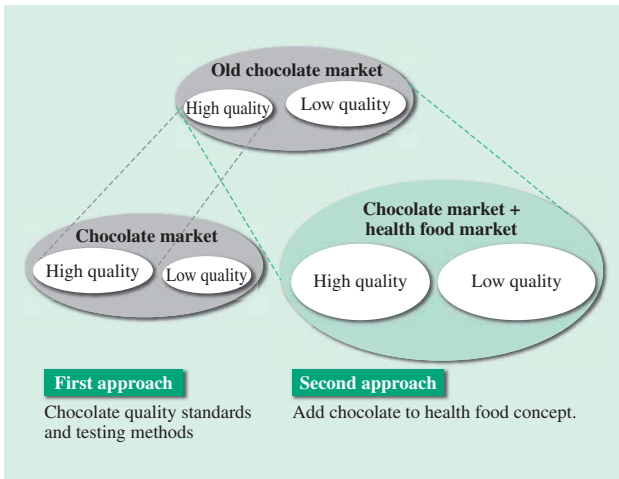


Fig. 3—Hypothetical Example of Chocolate Business. The second approach is to stipulate rules for society.

quality chocolate (see Fig. 3). The market in which Company A operates is shown in the figure as an ellipse. The high-quality chocolates made by the company have lost market share due to competition from low-quality/low cost products. How can the company use standards as a way to overcome this situation? Two different approaches can be considered.

The first approach is a strategy for achieving market share through differentiation. This assumes that the quality of the company’s products has not been recognized by consumers (even though they may appreciate the difference when they taste them). Establishing standards for chocolate quality and testing procedures makes this clear. One example of this sort of standardization is to use star labeling on packages to indicate quality grade, such as displaying five stars to represent high quality.

This approach is an easy one to imagine and is likely to prove beneficial. However, it is also likely to be difficult to implement. International standardization is a group exercise with representatives from numerous countries and companies working together and requires a consensus to be reached. It is not possible to leave out competitors who wish to participate. This means that it is difficult to reach agreement among all participants for these types of standards. In other words, very little “collaborative creation” takes place.

The second approach is to create standards that do not directly relate to the technology of chocolate making. Health foods are one example. Rather than specific products, this should be thought of as public rules for maintaining people’s health by improving dietary habits. This might include, for example, rules

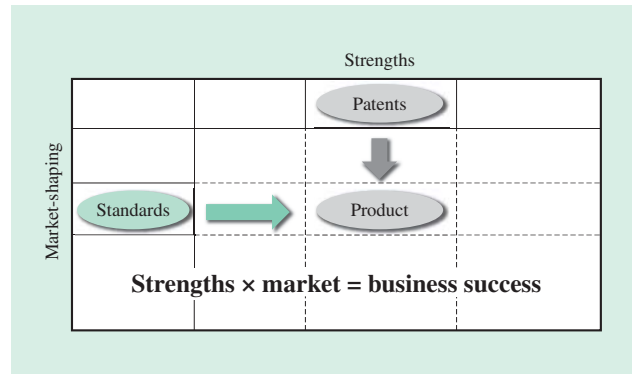


Fig. 4—Role of International Standards in Shaping Markets. Whereas patents protect a product’s strengths, standards act to shape their markets.

that promote polyphenols, of which chocolate has an abundance. While clearly this will not promote chocolate alone (because other products such as red wine also contain polyphenols), it nevertheless can significantly expand the total market by opening up a new market in terms of health food that is separate from chocolate’s traditional position as part of the confectionary industry.

Moreover, standards of this type are easy to establish. This is because industry competitors will also benefit to some extent. Whereas the first approach leaves the total market size unchanged, with competition within this market making it difficult to reach agreement, the second approach delivers a win-win outcome for everyone involved.

In other words, international standards can be thought of as an effective means of shaping international markets. This makes it an important factor in achieving business success alongside patent activities. Fig. 4 represents this view. If certain products have certain technical advantages, these can be effectively protected using patents, for example. However, this alone is insufficient to ensure the success of the business. The market of customers who recognize these advantages also needs to be large. Standards represent very effective tools for creating such markets.

As indicated by the examples above, the standards that promote business should not be those that relate to product technology but rather those that relate to how a product is used and the uses to which it is put (including services that use the product), and those that take the form of societal rules that uncover new value in the products. In this respect, these standards have a close affinity with the rule-making standards described earlier.

PERSPECTIVES ON UTILIZING STANDARDS FOR SOCIAL INNOVATION

This section looks at the relationship between standards and business from a different perspective (see Fig. 5).

The central part of Fig. 5 represents business activities in terms of their sequence. Almost all industries have developed based on a background of societal challenges, and as a way of overcoming them. The following explanation uses as an example the supply of energy to a city in an emerging nation where a national project has been launched to provide an electric power grid (a policy that has been adopted to overcome this challenge). As a result of the project, the power utility (which is a customer from the viewpoint of product suppliers) identifies the requirements, translates these into key performance indicators (KPIs), and undertakes an international procurement process. It is at this point that product suppliers bid for contracts. The company that wins the tender supplies the products and that company, or a local company, gets the contract for operation and maintenance.

In terms of this sequence, traditional standardization corresponds to the technical standards (product dimensions, performance, protocols, and so on) indicated by the box at the bottom of the figure. Typical examples are voltage standards, and rules regarding connector shapes, etc. that apply to transmission lines. The major objective and benefit of this type of standardization is commonality, meaning that, once formulated as an international standard, all companies are able to make use of the standard as they wish. As such, companies tend to view this as something they hope some other company or country will handle without their needing to contribute. In other words, there is little prospect of it helping them in their business.

Recently, however, keywords like “packages” and “turnkey” have been coming into vogue in relation to the export of social infrastructure. The sense in which these keywords are used extends beyond the supply of products to encompass solving problems on the customer’s behalf. That is, the scope of business is extending toward the upstream ends of the sequence of processes shown in Fig. 5.

Large and highly profitable European and American companies have adopted a business model under which downstream products tend to be purchased externally and added value is created at the upstream end. If Fig. 5 is thought of in terms of budget size, it

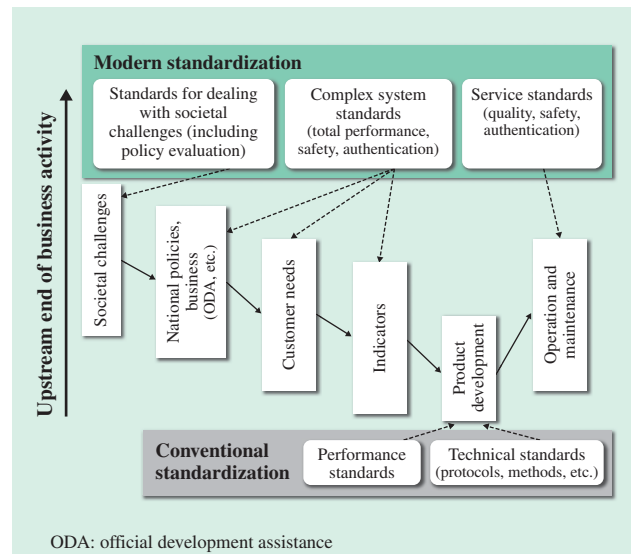


Fig. 5—Scope of Standardization and Sequence of Business Processes.

Modern standardization deals with the upstream end of business activity.

is clear that this becomes more finely resolved the further downstream it goes, resulting in lower profits. The most interesting processes are the upstream ones. Also, it is when looking further upstream that one encounters “societal challenges.”

It appears from this interpretation that the nature of standards that companies should be seeking in the future is different from those of the past. This means standardization that is targeted at “standards for dealing with societal challenges,” “complex systems,” and “services,” indicated by the boxes at the top of Fig. 5. Furthermore, this is something that various other countries have already recognized.

A clear trend has emerged among the topics of recently established specialist committees at ISO. Specialist committees called technical committees (TCs) or project committees (PCs) work on the formulation of standards in specific fields indicated by their titles. To issue an international standard (ISO standard) requires a two-thirds majority among the member countries of the associated committee. The topics of these committees differ considerably from how things are thought of in Japan. TC 247 deals with “Fraud Countermeasures and Controls,” TC 272 with “Forensic sciences,” and TC 292 with “Security and resilience.” As their names indicate, these committees deal directly with standardization of societal problems. That is, they formulate standards that stipulate rules for society.

As explained earlier, the international standardization mechanism has been given formal



TC: technical committee

Fig. 6—IEC TC 111 that Deals with Environmental Problems.
The photograph shows a scene from the TC 111 meeting at the 2014 Tokyo conference of the IEC.

status by the WTO and is able to create standards that are binding across all countries (standards for which there is a legal obligation of compliance). This means that standards of this type must be accepted without feeling awkward.

Meanwhile, it pays to remember, of course, that business motivations also lie behind all of this. Take the example of the TC 272 committee on “Forensic sciences.” To many readers, the title will be suggestive of the US crime show “Crime Scene Investigation (CSI)” or other police shows set in a forensic laboratory. These shows involve the use of the latest scientific analysis techniques to identify criminals.

The standard being formulated by this TC is ISO 18385, “Minimizing the risk of human DNA contamination in products used to collect, store and analyze biological material for forensic purposes.” It stipulates quality management procedures and verification methods for ensuring that the swabs and other items used to collect deoxyribonucleic acid (DNA) samples are not contaminated with other people’s DNA.

If, for example, a Japanese producer of high quality swabs for collecting DNA samples were to attempt to create an international standard, the committee might have been given the title, “Quality Requirements for DNA Collection Swabs.” In fact, the committee chair, Australia, chose “Forensic sciences” as the title. Behind this, it can be assumed, lies an intent

to expand the proprietary market for high-quality swabs. In practice, cases of false arrest resulting from contaminated swabs also likely provide a powerful incentive for the work.

With the title “Forensic sciences,” this committee has given itself a broad brief that will enable it to go on to create a variety of further standards once this one is complete. This may shape the markets for businesses that deal with a variety of new technologies relating to forensic science.

EXAMPLES

This section presents two examples of international standardization in which the author played a leadership role.

IEC TC 111

At the IEC, the author chairs TC 111, which is titled “Environmental standardization for electrical and electronic products and systems.” Meetings held by this technical committee (see Fig. 6) are regularly attended by close to 100 people, and its activities are deeply entwined with laws that give form to societal rules.

Fig. 7 shows one example. TC 111 has issued a standard (IEC 62321) that stipulates test methods for determining the concentration of hazardous substances in electrical and electronic products.

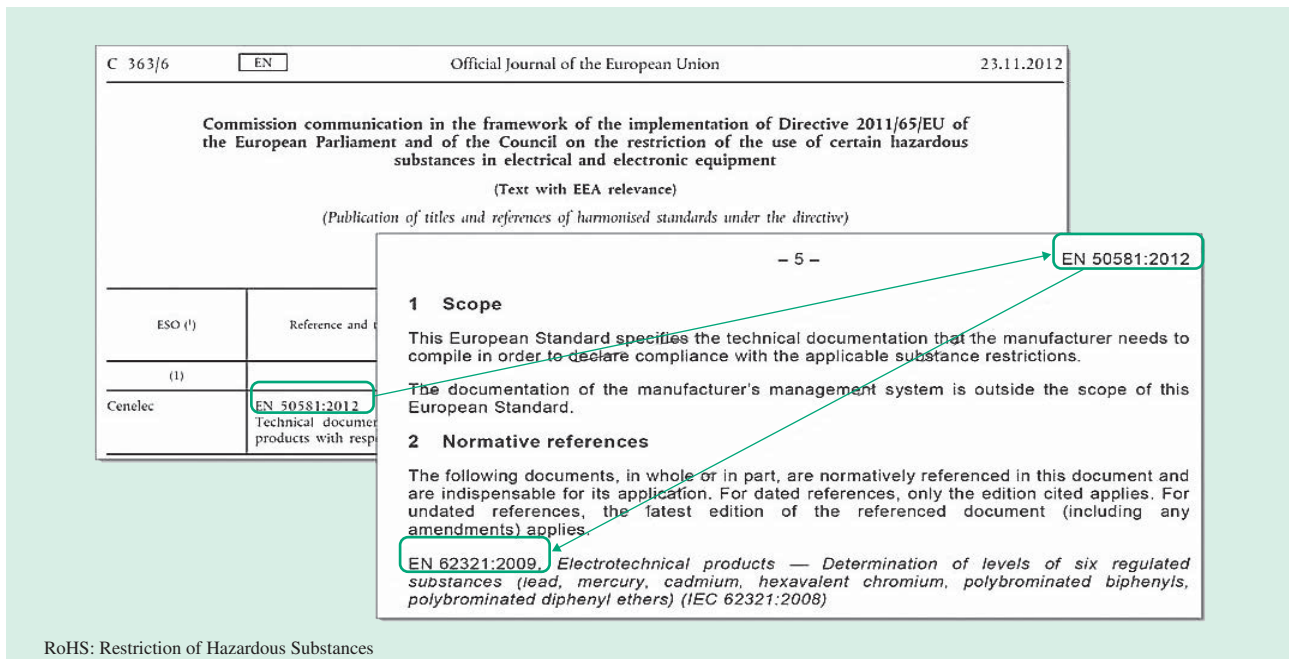


Fig. 7—Reference to Standard as Mandatory Requirement in Europe's RoHS 2 Directive.

Because the standard formulated by the TC 111 committee is referenced in the RoHS 2 directive as a mandatory requirement, it in effect stipulates the law.

This standard was formulated to check compliance with the Restriction of Hazardous Substances (RoHS) directive that has been widely adopted as law in Europe and other parts of the world (prohibiting the presence of cadmium and five other hazardous substances).

After TC 111 issued the standard, the European Commission (EC) issued European Standard (EN)* 50581 requiring compliance with the RoHS directive. This included a “normative reference” to (obligation to comply with) EN 62321, the standard created by IEC TC 111 (EN 62321 is word-for-word identical to IEC 62321). In effect, IEC TC 111 stipulated rules that came to form part of EU law.

The Japanese and other companies on TC 111 are the sort of companies that comply most closely with the RoHS directive, and had been working rapidly on developing technologies for this purpose. The standard can be thought of as one that will help these products exhibit their strengths in the market.

Fig. 8 shows another example of the results of this work. While environmental measures taken by Europe have in the past been focused almost exclusively on global warming, they have also recently been working on product policies targeted at resource efficiency. That is, policies designed to encourage wider adoption of products that are easy to recycle.

* Has force roughly equivalent to a law, such that compliance with the standard is treated as compliance with the law.

TC 111 had been involved in work on product recyclability from an early stage, and had been working toward the publication of Technical Report (TR) 62635 on methodologies for conducting quantitative assessments of recyclability from the design stage (TR 62635 was subsequently published in 2012). It was during this period that the author visited the Directorate-General for the Environment at the EC.

On informing an official who dealt with product policy that this TR was being drafted, the official requested to be included in the process. Naturally, this request was accepted and specialists were promptly dispatched to join in the committee's activities, with the resulting outcomes being included in a subsequent policy announcement. The underlined section of Fig. 8 states that rules had been significantly changed to be brought into line with IEC TR 62635. The power of standards can even influence the direction of future laws. Naturally, this can also be expected to provide business benefits by expanding the market for products with excellent recyclability.

ISO/TC 268/SC 1

Another international standards subcommittee (SC) on which the author serves as the Japan chair is ISO/TC 268/SC 1 “Smart community infrastructures.” This subcommittee also deals with a very upstream topic, that of urban problems, with a focus on smart

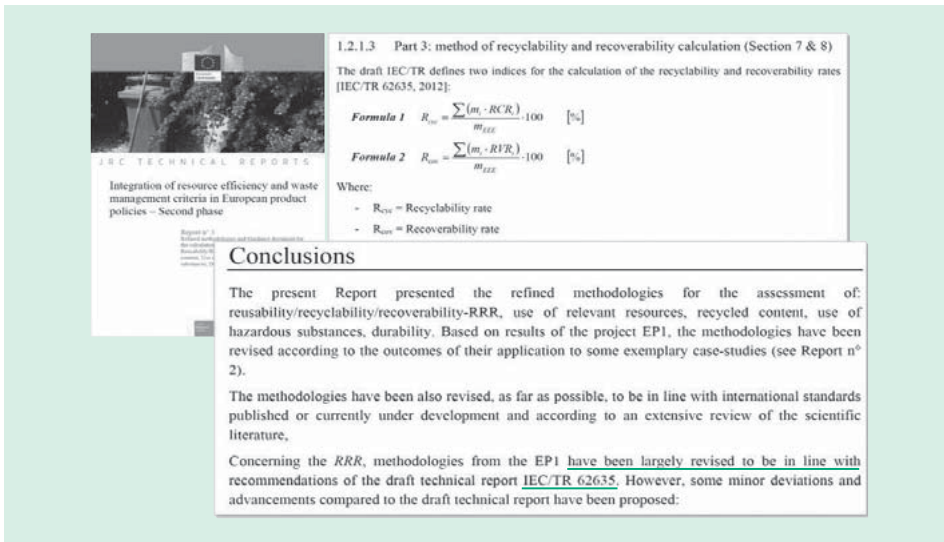


Fig. 8—Reference in Europe Policy Announcement. The European Commission policy announcement specifies major amendments to bring rules into line with the standard issued by the IEC TC 111 committee.

cities and infrastructure, areas that are closely related to business.

ISO/TC 268/SC 1 is a new subcommittee proposed by members of the Japan Smart Community Alliance (JSCA). The international proposal was issued in the winter of 2011 and the subcommittee started sitting in 2012. The subcommittee has already issued one technical recommendation (TR), ISO TR 37150, and it has a technical specification (TS), ISO TS 37151, on which international voting has been completed. Both of these deal with metrics for reviewing the “smartness” of community infrastructures.

When introducing social infrastructure in the future by exporting it to emerging economies in the form of packages or engaging in urban renewal, the aim will be to develop the rules that will shape the huge market for ensuring the widespread adoption of appropriate technologies that conform to these objectives.

CONCLUSIONS

Both the IEC TC 111 and ISO/TC 268/SC 1 committees referred to in this article are engaged in the creation, not of technical standards, but of rule-making standards. Standardization of the sort that can be utilized in business should not involve stipulating the technology itself, but rather should aim for standards for making effective use of that technology. Suitable areas for standardization are those such as societal challenges and services that are at the upstream end of business processes, and the aims should be to build win-win relationships with other industry participants to expand the market for the technology and to open up new markets.

REFERENCE

- (1) Y. Ichikawa, “Business and Standardization,” Jidosha Gijutsu, Vol. 69, pp. 51–56 (Jan. 2015) in Japanese.

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