



Challenges for Standards and Innovation Policies in the Emerging Global Knowledge Economy

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The international standardization landscape has dramatically changed over the last decade, and this is posing new challenges for standards and innovation policy.

Globalization has increased the economic importance of standards. Technology-based competition is intensifying, with the result that standards are used everywhere to create and shape markets and to control competition. This has transformed standards development from a slightly boring technical subject into a highly contested field of corporate strategy and public policy. As a result, standardization has become an integral part of innovation policy. At the same time, competition policy needs to be integrated with standards policy.

But while the importance of standards has increased, standards development has become more complicated and difficult to manage. Root causes include a rise in complexity, not only of technology, but also of business organization, market structure, and the regulatory environment. An additional aspect of complexity is the growing diversity of stakeholders in standards development. While engineers originally created this discipline, key concepts are now shaped by legal counselors as well as corporate executives and government officials. The result is what some observers have called a *fragmentation* of standard-setting communities.

Why does this matter?

Some say that the current market-led system of standardization is working well and that there is no need for policy adjustments. But the crisis tells us that markets work best when there is a strong regulatory framework.

However, the growing importance and complexity of standardization implies that established approaches to standards development that used to work well are now under pressure. We need to acknowledge that there are serious gaps in the governance of standards development. For instance, everyone agrees that we need “open” standards. But there is little agreement about what “openness” really means. Market leaders are rarely friendly to open standards when they dominate and eager to see them when they do not.

In this situation, “doing nothing is not simply inertia; it is a strategy with some winners and many losers.” (Karachalios, 2009) It is time for stakeholders in standardization (both in the private and public sector) to search for new institutional arrangements and policy responses. And this applies both to the US and China.

What explains the new standardization challenges?

Anyone involved in standardization knows how difficult it is to cope with the rapid pace of technical change. For instance, the growing complexity of information and communication technology requires *interoperability* standards that specify properties that a product or process must have in order to work with complementary products and processes. These standards are critical for designing and manufacturing digital computing, communication and consumer devices. Whether we look at laptops, smart phones or mobile base stations, these devices all need to become lighter, thinner, shorter, smaller, faster and cheaper, as well as more multi-functional and less power-consuming. To cope with these demanding performance requirements, engineers have pushed modular design and system integration, with the result that major building-blocks of a mobile handset are now integrated on a chip.

The implications for standards development are mind-boggling. Today’s typical high-end mobile handset combines hundreds of standards, coming from dozens of standard-setting

organizations, for camera, video, web browser, PDA, WIFI, Bluetooth, Linux, USB etc. Growing *technological complexity* obviously has increased the importance of standards. But it also has made standards development more complicated and difficult to manage.

But equally important is a rise in *organizational complexity* that results from two fundamental transformations in the international economy

- transformations in *business organization*, e.g., the expansion of global corporate networks of production and innovation; and
- transformations in *market structure*, e.g., the rise of new players from emerging countries (especially China) who can challenge the existing rules of standardization.

A defining characteristic of global networks of production and innovation is the sharing of data which requires interoperability standards. As these networks grow, information must flow and knowledge must be exchanged between groups that are isolated from each other, whether by methodologies, geography or culture. This requires standardization of diverse network interfaces.

At the same time, the growing complexity of these networks makes standards development much more demanding. Diverse network participants may share a common objective, but they use highly dissimilar vocabularies. To effectively coordinate multiple network interfaces requires shared definitions of the data that need to be exchanged, of the formats and protocols that govern data transfer and interpretation, and of the product specifications. In fact, the challenge for standardization now is no longer technology but the interactions of people who create and use the technology within these networks, i.e work practices and business routines.

The entry of new players obviously adds further to the new challenges for standards and innovation policies. China's rise poses new challenges to the established economic powers, including the US. As *interdependence* defines US-China economic relations, the US may have less influence to determine international standards development. For the new players, standards are important instruments for industrial and economic development. Compared to the established leaders with a long history in standardization, the new players have different needs and institutions, business models and capability sets. The new players are thus experimenting with new approaches. To reduce their dependence on foreign technology, these countries are hoping to move from being *standards-takers* to *standards-co-shapers* and ultimately to *standards-setters*. This raises the question: What are appropriate governance mechanisms for standards development that would allow reconciling 'efficiency' with fairness, equity and sensitivity to differences in economic development, institutions and capabilities?

A gap in research

Yet, despite the critical importance of standards for sustained economic growth and welfare, there has been very little research on the forces that are transforming the international standardization landscape, and on the resultant challenges for standards and innovation policies¹. The **Standards and Innovation Policy project** that I am directing for the East-West Center and the National Bureau for Asian Research seeks to fill this gap in our knowledge.

In my talk, I will draw on initial findings of this project and address three questions: (i) How does increasing technological complexity affect standards development in the ICT industry? (ii) What can we say about the impact of increasing organizational complexity, as manifested in the spread of global corporate networks of production and innovation? And (iii) what are possible implications of the entry of new players?

I will conclude with a few observations on what adjustments might be necessary in standards and innovation policies to cope with these new challenges.

¹ Exceptions include the pioneering studies of Linda D. Garcia, Michael Spring, Carl Cargill, Martin Libicki, Peter Lord and Konstantinos Karachalios.