

# Chapter 12

## Standards Development as Hybridization and Capacity Building

**Xiaobai Shen**

*University of Edinburgh, UK*

**Ian Graham**

*University of Edinburgh, UK*

**Robin Williams**

*University of Edinburgh, UK*

### ABSTRACT

*While users in the rest of the world have been offered 3G mobile phones based on either the CDMA2000 or W-CDMA standards, users in China have the additional option of using phones based on the TD-SCDMA standard. As a technology largely developed by Chinese actors and only implemented in China, TD-SCDMA has been seen as an “indigenous innovation” orchestrated by the Chinese government and supported by Chinese firms. China’s support for TD-SCDMA was widely viewed in the West as a ploy to keep the “global” 3G standards, W-CDMA and CDMA2000, out of China, but in 2009, the Chinese government licensed the operation of all three standards. The authors argue that Chinese support for TD-SCDMA, rather than being a defensive move, was a proactive policy to use the TD-SCDMA standard to develop Chinese industrial capacity, which could then be fed back into the global processes developing later generations of telecommunications standards. Rather than being an indigenous Chinese technology, TD-SCDMA’s history exemplifies how standards and the intellectual property and technological know-how embedded in them lead to a complex hybridization between the global and national systems of innovation.*

DOI: 10.4018/978-1-4666-6332-9.ch012

## **INTRODUCTION**

In January 2009 the Chinese government licensed three network operators to operate third generation(3G) mobile phone networks on three incompatible air interface standards: W-CDMA, CDMA2000 and TD-SCDMA (Time Division Synchronous Code Division Multiple Access). While W-CDMA and CDMA2000 had been implemented by operators around the world, China Mobile's use of TD-SCDMA was the platform's first large-scale implementation. TD-SCDMA has been described as "China's own 3G standard" (Fan, 2006), the "Chinese self-developed standard" (Yan, 2007), "China's... TD-SCDMA" (Kshetri, Palvia, & Dai, 2011), "China's TD-SCDMA standard" (Low & Johnston, 2010), "home-grown technology" (Wu, 2009), "China's homegrown telecommunications standard" (Hsueh, 2011) and "China's... locally developed standard" (Kwak, Lee, & Chung, 2012). This chapter provides a socio-technical analysis of this highly complex IT technology and argues that rather than see the competition amongst the three platforms as a standards war between an indigenous Chinese technology and two global competitors, TD-SCDMA should be seen as a hybrid technology that has emerged through an on-going process of greater engagement by China in global standards development, and that the knowledge generated in China during the development of TD-SCDMA technologies feeds back into global standards development. Detailed descriptions of the development of TD-SCDMA have been produced by Chinese writers, in particular Gao et al. (2012) and Hong et al. (2012), but their focus on the roles of Chinese actors reinforces the perception that TD-SCDMA is an indigenous Chinese technology. In contrast, we shall describe how TD-SCDMA developed through the growing engagement of China with global standards development and, rather than view the process as a clash between two immutable innovation systems, we argue that

the history of TD-SCDMA is best understood as a process of hybridization between the global and Chinese systems of telecommunications innovation.

Our analysis is based on a case study of the development of TD-SCDMA conducted within the China EU Information Technology Standards Research Partnership, supported by EU FP7.<sup>1</sup> The case used a combination of primary and secondary data. The former included interviews with actors involved in the development of TD-SCDMA from its beginnings as a collaboration between Chinese actors and Siemens, the European telecommunications equipment supplier, through to the launch of TD-SCDMA in 2010 as a commercial service in China. The interview data was supplemented by discussions in four workshops in China and Europe with industrial experts and policy-makers. Secondary data consisted of academic literature, general and specialised media reports and the official documents of governments and corporations. In this investigation the motivations of key actors were sometimes opaque and claims by actors, in particular the Chinese government agencies, treated with scepticism by many respondents<sup>2</sup>. However, through triangulation, it was possible to reconstruct an STS account of the social processes which have shaped TD-SCDMA.

## **1. DYNAMICS IN THE MOBILE TELECOMMUNICATIONS INDUSTRY**

Telecommunications and telecommunications equipment was identified as a strategically important 'pillar' industry in the Chinese 10<sup>th</sup> and 11<sup>th</sup> five year plans. The economic reforms had successfully transformed the Chinese telecommunications industry from being an impediment to economic development in the early 1980s to become its most vibrant sector by the mid-90s. Since 1986, China's five-year plans have emphasised the importance of high technology R&D and innovation (Ure,

12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/standards-development-as-hybridization-and-capacity-building/115278](http://www.igi-global.com/chapter/standards-development-as-hybridization-and-capacity-building/115278)

## Related Content

---

### Standards for Telecommunication Services

M. H. Sherif (2006). *Advanced Topics in Information Technology Standards and Standardization Research, Volume 1* (pp. 183-205).

[www.irma-international.org/chapter/standards-telecommunication-services/4664](http://www.irma-international.org/chapter/standards-telecommunication-services/4664)

### Standards Education Policy Development: Observations based on APEC Research

Donggeun Choi, Henk de Vries and Danbee Kim (2009). *International Journal of IT Standards and Standardization Research* (pp. 43-63).

[www.irma-international.org/article/standards-education-policy-development/4048](http://www.irma-international.org/article/standards-education-policy-development/4048)

### Community-Driven Specifications: XCRI, SWORD, and LEAP2A

Scott Wilson (2013). *Innovations in Organizational IT Specification and Standards Development* (pp. 250-263).

[www.irma-international.org/chapter/community-driven-specifications/70703](http://www.irma-international.org/chapter/community-driven-specifications/70703)

### Comparing the Standards Lens with Other Perspectives on IS Innovations: The Case of CPFR

M. Lynne Markus and Ulric J. Gelineas Jr. (2006). *International Journal of IT Standards and Standardization Research* (pp. 24-42).

[www.irma-international.org/article/comparing-standards-lens-other-perspectives/2572](http://www.irma-international.org/article/comparing-standards-lens-other-perspectives/2572)

### The Work of an International Standardization Consortia: Paths Towards its Current Structure

Endre Grotnes (2009). *International Journal of IT Standards and Standardization Research* (pp. 48-65).

[www.irma-international.org/article/work-international-standardization-consortia/2598](http://www.irma-international.org/article/work-international-standardization-consortia/2598)