China’s Rise in International ICT Standardisation: Techno-nationalism and Techno-globalism

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Outline

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2. Techno-nationalism and techno-globalism
3. China’s ICT standardisation
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1. Introduction

What is it?

- “Document approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, ...” (WTO, Agreement on TBT, Annex 1)
- De facto, De Jure, ...
Why standards/standardisation

- Lower transaction costs
- Grow the market size
- Bring sustained value (i.e. stability) to users and vendors
- Bring social integration

- Standards also may hinder promoting progress by imposing accepted (i.e., old) standards (e.g. QWERTY)
- Less diversity for consumers
Standards in ICT

- a set of technical specifications that allow communication between IT entities
- Competition
  - competition for establishing its own technology as a standard
  - thereby the standard owner can dominate a market where the standard is widely and inevitably used
- Standards wars!
1. Introduction

Camera: MPEG4

Broadcasting: DMB, ATSC

Video: MPEG, H264

Communication: LTE, CDMA

Others: NFC, etc.
How to dominate

- Network effects; network externalities
- Positive feedback
- Path dependency
- Lock-in
- Switching costs
- Possible inefficiency

Many successes of digital businesses (and media) can be explained from the perspective of standards and platform competition.
1. Introduction

Recent developments

- A patent that must be used to comply with a (technical) standard
- A patent is called essential if it is necessarily infringed by any implementation of the standard
Techno-nationalism

- Limited participation of foreign actors in domestic R&D, with a focus laid on national gains through accessing foreign technology and the monopolization of technology rather than on mutual exchange with other nations (Edgerton, 2007)

- “autonomy over dependence on foreign technology, the diffusion of knowledge among national users, and the nurturance of domestic scientific and technological capabilities” (Keller and Samuels, 2003)

- “a domestic economy can be mature, and the nation secure, only if it exerts substantial control over the generation of knowledge and the standards by which design and manufacture are undertaken” (Keller & Samuels, 2003)
Global barriers to the transfer and diffusion of technology and innovation should be reduced.

While states provide infrastructure for R&D, they do so only at the level of basic science research.

Applied or commercial technology development is the responsibility of individual firms (Keller & Samuels, 2003).
3. China’s ICT Standardisation

China’s Innovation Strategy

- Aims to establish an innovation society and build the world’s best R&D capability by 2020
  
  - China's 2013 R&D spending estimate is $220 billion, while US’ $424 billion; yet China set to surpass U.S. in R&D spending in 10 years according to the 2013 Global R&D Funding Forecast by Battelle (Computerworld, 2012)
  
  - According to the 2011 Royal Society report, China was second only to the US in terms of its share of the world's scientific research papers written in English, and it could soon overtake the US (The Guardian, 2011)
  
  - In 2011, China received over 526k patent applications compared to over 503k for the US (WIPO, 2012)

- The government believes that the development of technical standards plays a key role in the establishment of a system for innovation economy.
3. China’s ICT Standardisation

China’s ICT Standardization

- Patent trap: the more it sells products, the more it pays royalties to firms which own patents;
  - Risks of becoming a subordinate player in the global production network

- In 2006, the Chinese gov’t unveiled its 15–year plan to promote indigenous innovation and lessen dependence on foreign technology
  - Targets include the development of unique technical standards that would reduce dependence on foreign technology by 30% by 2020
3. China’s ICT Standardisation

Cases: WAPI

- Wireless LAN Authentication and Privacy Infrastructure
  - Security protocol for wireless
  - Mandated use announced with a short notice
  - The protocol only given to Chinese firms
  - Led to a trade dispute with USA
  - Withdrew the plan

- Some quotes
  - “Market is the Pillar of Standards.”
  - “Why can’t we use our huge market to make Chinese standards as international standards?”

Fig. 1. The relationship between WAPI and other protocols (from Lee & Oh, 2006).
3. China’s ICT Standardisation

Cases : TD–SCDMA

- 2G Mobile Standard was bifurcated by Europe GSM and US CDMA
- Datang developed 3G TD–SCDMA in collaboration with Siemens
  - 2000; approved as a 3G international standard by ITU
  - 2001: by 3GPP
  - 2006: a Chinese national standard
- The gov’t support played a significant role
  - in the process of TD–SCDMA becoming an international standard
  - the industrialization of TD–SCDMA
    - e.g. in October 2002, the MII allocated 155MHz of 3G radio frequency spectrum to TD–SCDMA compared to 60MHz for CDMA 2000 and W–CDMA
3. China’s ICT Standardisation

Cases : TD–LTE

In January 2012, 4G TD–LTE, a next generation technology to TD–SCDMA, approved as an international standard by ITU.

Currently, the Chinese gov’t actively supports the promotion of TD–LTE, which was built upon Chinese technology:
  - e.g. to allocate 190MHz of frequency spectrum in the 2.6GHz band for TD–LTE deployment.
Why?

- Alternative to Western technology
- No or less royalty payment
  - Bargaining Chip/leverage
- Full package
  - e.g. aid to developing countries
  - “China’s 60th Anniversary, its Rise in Soft Power and ICT Standardisation”
- National agenda for innovation economy
  - Technical standards as a pillar
  - “third-class enterprises sell products, second-class technology, and first-class standards”
## Techno-nationalism & -globalism

<table>
<thead>
<tr>
<th></th>
<th>WAPI</th>
<th>TD–SCDMA</th>
<th>TD–LTE</th>
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</thead>
<tbody>
<tr>
<td>National standard</td>
<td>Not to become ‘the’</td>
<td>‘a’ national standard</td>
<td>‘a’, but in fact ‘the’</td>
</tr>
<tr>
<td></td>
<td>national standard</td>
<td></td>
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<tr>
<td>Type of standard</td>
<td>De jure</td>
<td>De facto (one of the</td>
<td>De facto</td>
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<td></td>
<td></td>
<td>three)</td>
<td></td>
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<tr>
<td>R&amp;D</td>
<td>Chinese</td>
<td>Siemens + Chinese</td>
<td>More Chinese</td>
</tr>
<tr>
<td>Alliance with</td>
<td>none</td>
<td>Alliance with Siemens</td>
<td>More</td>
</tr>
<tr>
<td>foreign firms</td>
<td></td>
<td>from the beginning</td>
<td></td>
</tr>
<tr>
<td>Government role</td>
<td>controller</td>
<td>Still in controller, but</td>
<td>Less controller, more</td>
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<tr>
<td></td>
<td></td>
<td>facilitator</td>
<td>facilitator</td>
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<tr>
<td></td>
<td>Closed</td>
<td>Open</td>
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<td></td>
<td>TG</td>
<td>TG</td>
<td>TG</td>
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### 4. Discussion
For standardisation, technical superiority is just a necessary condition
  ◦ Political support
  ◦ Ability to coordinate diverse interests of the stakeholders → alliance

In building, developing, and maintaining alliances, relatively more weight is placed on links with foreign firms over time than with local firms.

China is increasingly open to foreign firms to gain their support and cooperation, which is required for international standardization and commercialization of locally-developed standards.

TN → TG?
## 4. Discussion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Chinese Standards</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Video Players</td>
<td>VCD 3.0, CVD, EVD, HDV, HVD, CBHD</td>
<td>SVCD, DVD, Blu-Ray, HD-DVD</td>
</tr>
<tr>
<td>Mobile Telephony</td>
<td>TD–SCDMA, TD–LTE</td>
<td>WCDMA, CDMA2000, LTE</td>
</tr>
<tr>
<td>Wireless LAN Encryption</td>
<td>WAPI</td>
<td>IEEE 802.11i</td>
</tr>
<tr>
<td>Audio–Video Encoding/Decoding</td>
<td>AVS</td>
<td>MPEG2, MPEG4–3(AAC), MPEG 4–10(H.264), VC–1</td>
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<tr>
<td>Digital Trunking</td>
<td>GoTa, GT800</td>
<td>TETRA, iDEN</td>
</tr>
<tr>
<td>Document Formatting</td>
<td>UOF</td>
<td>ODF, OOXML</td>
</tr>
<tr>
<td>Home Networking</td>
<td>IGRS, ITopHome</td>
<td>DLNA, UPnP, KNX, ECHONET</td>
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<tr>
<td>Mobile Phone Charger</td>
<td>YD/T 1591–2006</td>
<td>None</td>
</tr>
<tr>
<td>Mobile TV</td>
<td>CMMB, T–MMB, CDMB, DMB–T, CMB</td>
<td>DVB–H, T–DMB, MediaFLO</td>
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<tr>
<td>Radio Frequency Identification (RFID)</td>
<td>NPC</td>
<td>ISO 18000 and others, EPC/ GS1, Uid</td>
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<td>Security Computer Chip</td>
<td>TCM</td>
<td>TPM</td>
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<tr>
<td>Wireless Metro Area Network</td>
<td>McWill</td>
<td>WiMax</td>
</tr>
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</table>
Responses

- **EU**
  - To coordinate EU policies with China’s indigenous innovation and standardisation policies

- **US**
  - See as a threat to its standardisation regime

- **Korea**
  - Another newcomer to the international standards regime; e.g. WiBro
  - Competition or collaboration?
US Response

“*The Rise of China in Technology Standards: New Norms in Old Institutions*”
- Chinese unique standards not achieved some of their goals like;
  - To develop indigenous innovation capabilities
  - To secure a new revenue stream
- New norms
  - Chinese standards efforts establishing new norms of low prices for embedded IPRs in standards
  - e.g. by developing Chinese standard AVS, China was able to set a royalty rate for AVC at $0.15 per unit (cf. MPEG–2, AVC’s predecessor at $2.5 per unit)

5. Conclusion
China may become a new front in the global patent war (Washington Post, 2012)