

**CHINA'S INTERNATIONAL TECHNOLOGY  
STANDARDS STRATEGY AND  
THE DIGITAL SILK ROAD**

Erik BAARK

*EAI Background Brief No. 1604*

Date of Publication: 13 August 2021

## Executive Summary

1. Technical standards have become critical infrastructure for global supply chains and international trade, and leading firms in advanced high technology sectors, often based in the United States or Europe, have become dominant in defining new standards.
2. Chinese industries have felt compelled to follow international standards often built on intellectual property of Western firms. Chinese ICT manufacturers have to cost in licences to foreign intellectual property that cut into their slim profits.
3. The Chinese government is working to transform the country from a “standards taker” to a “standards maker” by setting Chinese technology standards. This has led to the launch in 2020 of the national China Standards 2035 Strategy.
4. International observers are concerned that China’s ability to propose core innovations in emerging technological fields such as 5G and Artificial Intgelligence will increase China’s capacity to transform the international standardisation landscape.
5. In June 2019, it had signed 85 cooperation agreements on technical standardisation with 49 countries and regions along the Belt and Road to promote adherence to Chinese standards.
6. The ambitions of the Belt and Road Initiative were closely related to President Xi Jinping’s Chinese Dream vision of returning China to its historical role as the centre of the world. The initiative is to support policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds.
7. In 2015, the “Digital Silk Road” (DSR) was to cover a broad range of digitalisation along the Belt and Road, including cross-border e-commerce, data rules and security, digital health care and online education. By end 2019, China had signed 199

documents on digital cooperation under the Belt and Road Initiative with 137 countries and 30 international organisations.

8. DSR projects concentrate on expanding China-installed fibre optic cables as terrestrial connections across Eurasia and undersea cables in the Indian and Pacific Oceans. The DSR is connecting the world with the Chinese BeiDou Navigation Satellite System to expand communication channels and provide global location services that do not depend on the US-operated GPS.
9. The exports to DSR countries of optical fibre communications, 5G mobile phone networks, cloud computing facilities and various surveillance equipment with features such as face recognition thus create useful opportunities for China to install advanced technology abroad and gain “soft power” by assisting countries in reducing the impact of the COVID-19.
10. The risk is a global digital bifurcation between the United States and China. With the diffusion of digital technical standards from China and the increased dependence on Chinese digital networks, it could lead to a split between a US-led coalition of champions of Western telecommunications, internet and software, and a Chinese coalition of DSR standards and networks.

# CHINA'S INTERNATIONAL TECHNOLOGY STANDARDS STRATEGY AND THE DIGITAL SILK ROAD

Erik BAARK\*

## Significance of Technical Standards in Globalisation during the Digital Era

- 1.1 Technical standards have been essential since the 19th century to ensure the compatibility of individual components, guarantee safety and promote interoperability of systems. In the First Industrial Revolution, interchangeable parts appeared as the first instance of interface standards. In the Second Industrial Revolution (approximately from the 1880s to the 1950s), standardisation spread to important industrial infrastructures such as product standards in chemicals and interoperability standards in communication networks. Standards promote productivity and have been shown to contribute significantly to economic growth.<sup>1</sup>
  
- 1.2 Today, technical standards regulate a wide range of economic activities and personal life – from the voltage of electricity supply to the internet and certification of safe products. While standards were initially adopted at the national level, they have increasingly been set at an international level by technical committees with participation from governments and industrial representatives. Standards have become critical infrastructure for global supply chains and international trade; leading firms in advanced high technology sectors have become dominant in the process of defining new standards. Accordingly, such firms and the country that contribute proprietary technology for standards may become highly competitive in the marketplace, which has in turn led to new geopolitical conflicts.

---

\* Erik Baark is Professor Emeritus at the Hong Kong University of Science and Technology and a former Visiting Research Professor at the East Asian Institute, National University of Singapore.

<sup>1</sup> Gregory Tassej, "The Roles and Impacts of Technical Standards on Economic Growth and Implications for Innovation Policy", 2017. <https://www.researchgate.net/publication/319935717> (accessed 10 June 2021).

- 1.3 This phenomenon has been particularly evident for information and communications technologies (ICT) where competition between adherents of either European GSM or American CDMA in third generation mobile phone systems (or the Chinese TD-SCDMA system) split the world into separate regions. Similar tension emerged with the definition of standards for videotape or optical disk encoding, and for wireless communication.
- 1.4 Chinese industries have felt compelled to follow international standards which are often built on intellectual property owned by Western firms and Chinese ICT manufacturers have witnessed the cost of licences to foreign intellectual property (IP) cutting into their slim profits.<sup>2</sup> The Chinese leadership has also wished to obtain “secure and controllable” networks of communication, with the role of standards for achieving this objective increasing only in recent years.<sup>3</sup>
- 1.5 There is no doubt that the Chinese government has wished to transform the country from a “standards taker” to a “standards maker” through the development of unique Chinese technology standards. This has led to the launch of a national China Standards 2035 Strategy in 2020. This strategy is to strengthen the system for developing Chinese standards in advanced, high value-added manufacturing and service industries like 5G communications, the Internet of Things (IoT) and artificial intelligence (AI).

### **China’s International Standardisation Efforts**

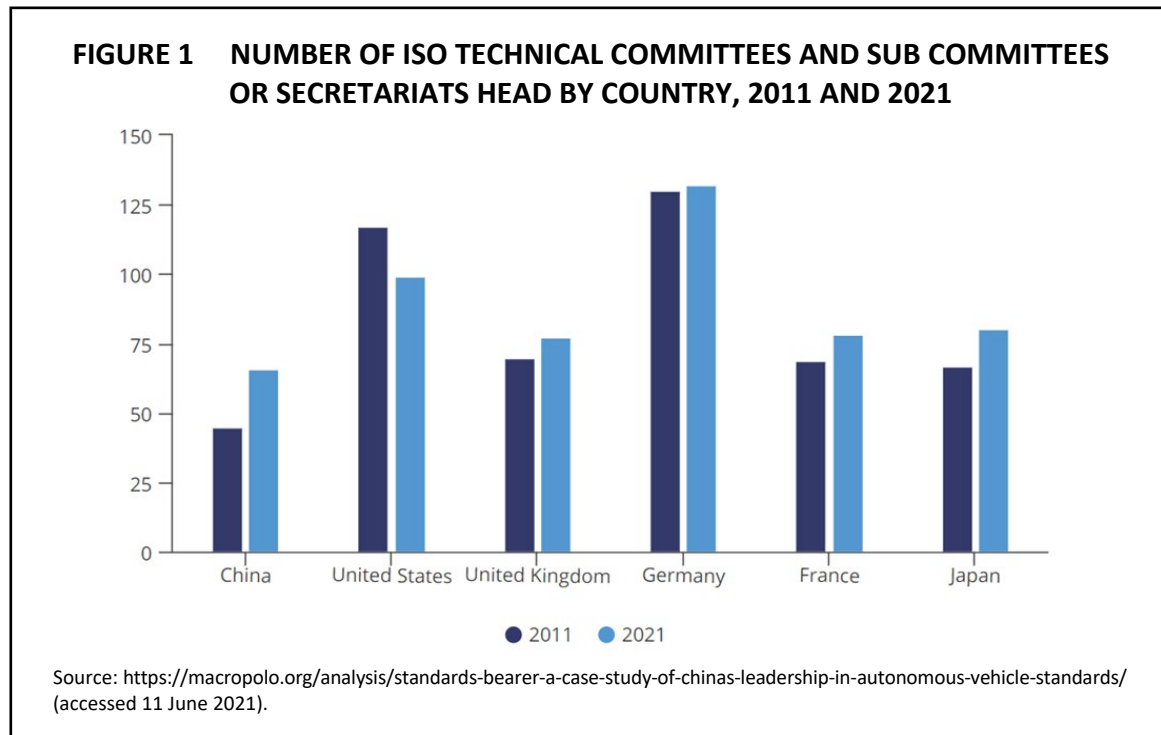
- 2.1 Chinese efforts have been particularly aimed at generating new intellectual property for standards in advanced technologies such as 5G and AI where competition for new innovations is particularly strong. Ultimately, the Chinese ambition is to rely on state-supported efforts to reshape the international standardisation order in order

---

<sup>2</sup> Dan Breznitz and Michael Murphree, *The Rise of China in Technology Standards: New Norms in Old Institutions*. Research Report Prepared on Behalf of the US-China Economic and Security Review Commission, 16 January 2013, <https://www.uscc.gov/sites/default/files/Research/RiseofChinainTechnologyStandards.pdf> (accessed 10 June 2021).

<sup>3</sup> Ernst, Dieter, Lee Heejin and Kwak Jooyoung. 2014. “Standards, Innovation, and Latecomer Economic Development: Conceptual Issues and Policy Challenges”, *Telecommunications Policy*, 38, 10: 853–62.

to challenge existing systems such as those of the United States and Europe, which depend to a much larger degree on private self-regulation.<sup>4</sup>



2.2 An important step has been to rapidly increase participation in leading international organisations for standardisation. Chinese membership of technical committees and working groups in the International Standardisation Organisation (ISO) doubled in percentage between 2011 and 2018. A similar growth of Chinese participation has taken place in leading technical committees for standards in the information technology and telecommunications field, the International Electrotechnical Commission (IEC).

2.3 China’s participation is currently reaching the highest levels of international standards setting when Zhang Xiaogang became elected as ISO president in 2015, and more recently when Shu Yinbiao was elected to the post of IEC president from 2020.<sup>5</sup> This potential influence has raised alarm in the United States, Europe and

<sup>4</sup> Björn Fägersten and Tim Rühlig, *China’s standard power and its geopolitical implications for Europe*. Stockholm: The Swedish Institute of International Affairs, 2019. <https://www.ui.se/globalassets/ui.se-eng/publications/ui-publications/2019/ui-brief-no.-2-2019.pdf> (accessed 10 June 2021).

<sup>5</sup> John Seaman, *China and the New Geopolitics of Technical Standardization*. Notes de l’Ifri, January 2020. <https://www.ifri.org/en/publications/notes-de-lifri/china-and-new-geopolitics-technical-standardization> (accessed 11 June 2021).

Japan, even if they have traditionally held the positions of the majority of members on ISO and IEC committees. The worry is that China's ability to propose core innovations in a growing number of emerging technological fields such as 5G and AI will increase China's capacity to transform the international standardisation landscape and to increasingly seek to shape international standards in line with its own interests.

2.4 An analysis of Chinese and international process of formulation of safety testing standards for autonomous vehicles (AV), an emerging technology that also represents a promising global industry and complex ethical questions, illustrates how China has developed a sophisticated domestic standards bureaucracy that provides support to official Chinese representatives to formulate mature Chinese proposals that can be brought to the international body.<sup>6</sup> However, in this case study of AV safety standards, China so far does not appear to be abusing its leadership role of the working group, such as stacking it with Chinese representatives or forcing the international bodies to adopt Chinese standards.

2.5 However, China has been quite explicit about its ambitions to enter the frontiers of technical standardisation and seek international influence in the field – these objectives are clearly stated in the China Standards 2035 strategy, drafted in 2020 and designed to reform China's work in domestic and international standards formulation, particularly for emerging fields in telecommunications, e-commerce platforms and artificial intelligence.<sup>7</sup> The aim of the China Standard 2035 initiative is to influence how the next generation of technologies will operate, which is obviously a direct challenge to the existing dominance by stakeholders from the United States and Europe.<sup>8</sup>

---

<sup>6</sup> Matt Sheehan, "Standards Bearer? A Case Study of China's Leadership in Autonomous Vehicle Standards", Marco Polo Analysis, 3 June 2021. <https://macropolo.org/analysis/standards-bearer-a-case-study-of-chinas-leadership-in-autonomous-vehicle-standards/> (accessed 11 June 2021).

<sup>7</sup> The work on China Standard 2035 officially kicked off in 2018, see <http://www.cnstandards.net/wp-content/uploads/2019/03/China-Standard-2035.pdf> (accessed 14 June 2021) See also Emily de La Bruyère and Nathan Picarsic, *China Standards 2035: Beijing's Platform Geopolitics and "Standardization Work in 2020"*, <https://www.horizonadvisory.org/chinastandards> (accessed 14 June 2021).

<sup>8</sup> For a detailed presentation of US perspectives, especially emphasising security issues, see J Ray Bowen II, *A 'China Model?' Beijing's Promotion of Alternative Global Norms and Standards*. [https://www.uscc.gov/sites/default/files/testimonies/March%202013%20Hearing\\_Panel%203\\_Ray%20Bowen%20Pointe%20Bello.pdf](https://www.uscc.gov/sites/default/files/testimonies/March%202013%20Hearing_Panel%203_Ray%20Bowen%20Pointe%20Bello.pdf) (accessed 14 June 2021).

- 2.6 Nevertheless, China has successfully cooperated with Germany, a leading nation in the network of national and international technical standards formulation. Focusing on sectors and technologies associated with smart manufacturing, the two countries have signed agreements for cooperation in standards development for *Industrie 4.0*, a major German effort to develop automation in industry that was also a significant source of inspiration for the Chinese “Made in China 2025” programme.<sup>9</sup>
- 2.7 Perhaps the field of technology where China has been most successful in using its newfound R&D capabilities to influence international technical standards is 5G mobile communication systems. Leading Chinese telecommunications firms hold a large portion of the intellectual property that have been adopted as standard essential patents (SEPs) for 5G standards, with Huawei owning 15.39% and ZTE 9.81% share of 5G declared patent families.<sup>10</sup> Moreover, Huawei won recognition for its polar codes software, developed on the basis of research by Erdal Arikan, as the international standard for data transmission in 5G.<sup>11</sup>
- 2.8 One of the means to promote Chinese standards overseas that has already been put into action is to include work on standardisation in the diplomatic relations with other nations in the Belt and Road Initiative (BRI). In June 2019, China officially announced it had signed 85 cooperation agreements on technical standardisation with 49 countries and regions along the Belt and Road.<sup>12</sup> This also points to the significance of the BRI for internationalising Chinese technology.

---

<sup>9</sup> Fuchs, Daniel and Eaton, Sarah, Diffusion of Practice: The Curious Case of the Sino-German Technical Standardization Partnership (1 October 2020) <http://dx.doi.org/10.2139/ssrn.3723303> (accessed 15 June 2021).

<sup>10</sup> IPlytics, *Who is leading the 5G patent race?* February 2021. <https://www.iplytics.com/report/5g-patent-race-02-2021/> (accessed 5 July 2021).

<sup>11</sup> Dave Makichuk “Huawei’s 5G tech advantage has roots in the 40s”, *Asia Times*, 19 November 2019. <https://asiatimes.com/2020/11/huaweis-5g-tech-advantage-had-roots-in-the-40s/> (accessed 6 July 2021).

<sup>12</sup> Tim Nicholas Rühlig, Technical standardisation, China and the future international order. A European perspective. <https://eu.boell.org/en/2020/03/03/technical-standardisation-china-and-future-international-order> (accessed 15 June 2021).



## **China's Ambition to Become a Technological Superpower by 2050**

- 3.1 During the past decade, the emergence of Chinese capabilities in scientific research and technological innovation has raised the Chinese leadership's ambitions to become a technological superpower in the future. President Xi Jinping had outlined the current thinking at China's 19th National Congress of the Communist Party in 2017 predicting that by 2035, "China's economic and technological strength has increased significantly. China has become a global leader in innovation", and envisaging that in 2050, "China has become a global leader in terms of composite national strength and international influence".<sup>13</sup>
- 3.2 More recently, Xi has stated: "If China wants to prosper and rejuvenate, it must vigorously develop science and technology and strive to become one of the world's major science centers and an innovation highland... Now, it is imperative to build China into a global scientific and technological power more than at any time in history".<sup>14</sup> He also called for more participation in global sci-tech governance with a focus on issues such as climate change and human health, as well as more joint research and development with scientific researchers from other countries.
- 3.3 Hence, China expects to expand its international network for collaboration on technological innovation and take up a leading position in global technology exchange system. This endeavour involves strengthening the policy of "going out" that China launched in 2000 for enterprises investing internationally – that has tended to lose momentum in recent years – involving a broader range of initiatives with Chinese technologies and expertise.

## **Linking the World to China: The Belt and Road Initiative**

- 4.1 The ambitions of the BRI when it was launched in 2013 were closely related to President Xi Jinping's Chinese Dream vision – to return China to its historical role as the centre of the world. The aims of the initiative included support for policy

---

<sup>13</sup> [http://www.xinhuanet.com/english/download/Xi\\_Jinping's\\_report\\_at\\_19th\\_CPC\\_National\\_Congress.pdf](http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf) (accessed 9 June 2021).

<sup>14</sup> <https://www.globaltimes.cn/page/202103/1218422.shtml> (accessed 9 June 2021).

coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds. During the first phase of the initiative, the main concern appears to have been devoted to the construction of extensive infrastructure such as railways and ports in Asia and Europe, undertaken mostly by major Chinese state-owned corporations, and financed primarily with loans from policy banks such as the Chinese Development Banks and Exim Bank of China.

- 4.2 In 2015, China established the Asian Infrastructure Investment Bank (AIIB) to facilitate and accelerate infrastructure improvement in BRI countries by providing capital loans and technical services. The AIIB received support from several countries, even if it was shunned by the powerful US administration.<sup>15</sup>
- 4.3 In terms of the selection, financing and implementation of infrastructure projects, the AIIB has sought to follow the approaches of other major international development banks, such as the World Bank and Asian Development Bank. A study of AIIB loan data through the end of 2019 found that countries with weak economic ties to China have better access to the AIIB in terms of being more likely to receive larger loans more quickly – indicating a less overt influence by China than earlier criticism had suggested.<sup>16</sup>
- 4.4 In the United States, the BRI was interpreted as a challenge to the existing geopolitical balance that was enticing developing countries in Asia and Africa to sign up for large projects with considerable debt burdens; and ultimately, these projects were designed to further Chinese exports rather than help domestic infrastructure needs. The initial reaction of the European authorities was positive but cautious, greeting the BRI as a useful way to enhance logistic connections between China and Europe. However, some observers worried that a large proportion of BRI projects were based on loans from Chinese state-owned banks operating according to Chinese standards; European authorities wanted procedures

---

<sup>15</sup> Hong Yu, “Motivation behind China’s ‘One Belt, One Road’ Initiatives and Establishment of the Asian Infrastructure Investment Bank”, *Journal of Contemporary China*, 26:105, 353-368.

<sup>16</sup> Ayse Kaya, Christopher Kilby and Jonathan Kay, “Asian Infrastructure Investment Bank as an instrument for Chinese influence? Supplementary versus remedial multilateralism”, *World Development* 145 (2021).

to follow international – rather than Chinese – norms for project financing, procurement and management.<sup>17</sup>

4.5 The investments for expansion of energy exploitation, pipelines, rail lines and port facilities in countries identified as part of the Belt and Road (some of which were in Sub-Saharan Africa and South America, quite far from the traditional Silk Road) continued to grow substantially after 2013. In some cases, projects that had been initiated before the BRI was formally launched were subsequently included in the BRI portfolio. Investments and loans allocated by China to BRI countries favoured engineering projects and exports, especially compared to non-BRI countries.<sup>18</sup>

4.6 Due to growing hostility in advanced economies to Chinese “Going out” investments since 2018, China’s global investments have declined – from a maximum of US\$170.6 billion in 2017 to US\$77.3 billion in 2019. The BRI captures the vast majority of Chinese construction investments: US\$425 billion from 2014 through 2019, and US\$67 billion in 2019 alone.<sup>19</sup> At the same time, many of the challenges that were encountered in BRI required that Chinese authorities recognise the importance of a continued effort to open up, reform the financial sector, and improve technological capabilities so as to promote economic cooperation and integration in both trade and financial markets.

4.7 To provide an alternative to BRI, the G7 leaders of advanced industrialised countries in June 2021 decided to launch the Build Back Better World (B3W) Partnership. This initiative aims to provide financing up to US\$40 trillion by 2035 for infrastructure in low- and middle-income countries, covering four focus areas: climate, health and health security, digital technology, and gender equity and

---

<sup>17</sup> Erik Baark, “European Perspectives on the Chinese Belt and Road Initiative”, *China: An International Journal*, Volume 17 Number 4 (November 2019), pp. 76-95.

<sup>18</sup> Saileshsingh Gunessee and Jianmin Liu, “The Economics of the Belt and Road Initiative” in Hing Kai Chan, Faith Ka Shun Chan and David O’Brien (eds.), *International Flows in the Belt and Road Initiative Context*, Palgrave Macmillan, 2020.

<sup>19</sup> Derek Scissors, *China’s Global Investment Vanishes Under COVID-19*. American Enterprise Institute, July 2020. <https://www.aei.org/research-products/report/chinas-global-investment-vanishes-under-covid-19/> (accessed 21 June 2021).

equality.<sup>20</sup> The B3W has been launched at a time when other initiatives to counter BRI have hardly succeeded to entice potential partner countries to shift their priorities – a fate that may also characterise B3W.

### **The Digital Silk Road**

5.1 Partly due to issues that occurred in relation to the investment in costly physical infrastructure construction projects, and partly inspired by a shift in Chinese reform thinking and its strong emphasis on development of high technology sectors, the BRI underwent a gradual change in focus. The new directions were set out in a joint statement by the National Development and Reform Commission, Ministry of Foreign Affairs and Ministry of Commerce in March 2015 which included a passage about creating an “Information Silk Road”:<sup>21</sup>

We should jointly advance the construction of cross-border optical cables and other communications trunk line networks, improve international communications connectivity, and create an Information Silk Road. We should build bilateral cross-border optical cable networks at a quicker pace, plan transcontinental submarine optical cable projects, and improve spatial (satellite) information passageways to expand information exchanges and cooperation.

5.2 Shortly afterwards this complementary initiative for BRI became better known and referred to as the “Digital Silk Road” (DSR) and received additional impetus from Xi Jinping at the inaugural Belt and Road Forum in May 2017. At the same time, DSR gradually came to encompass a broad range of digitalisation: cross-border e-commerce, data rules and security, digital health care and online education.

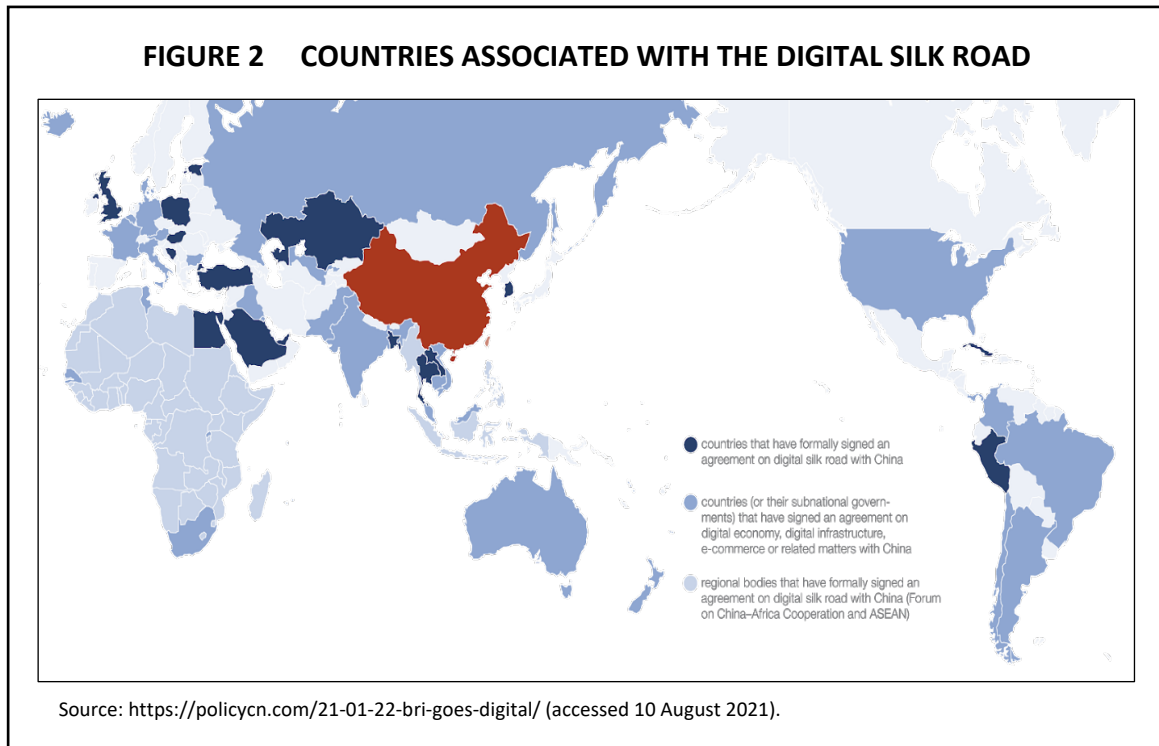
5.3 By the end of 2019, China had signed 199 cooperation documents under the framework of the BRI with 137 countries and 30 international organisations. These include international cooperation on digital trade, with agreements on electronic signatures, paperless trading, transparency, electronic transmission, tax exemptions

---

<sup>20</sup> Syed Zain Abbas Rizvi, “Build Back Better World: An Alternative to the Belt and Road Initiative?” *Modern Diplomacy* 18 June 2021. <https://moderndiplomacy.eu/2021/06/18/build-back-better-world-an-alternative-to-the-belt-and-road-initiative/> (accessed 3 July 2021).

<sup>21</sup> Xinhua, ”Full Text: Vision and actions on jointly building Belt and Road”, <http://2017.beltandroadforum.org/english/n100/2017/0410/c22-45.html> (accessed 15 June 2021).

and other related content.<sup>22</sup> Multilateral and regional organisations such as ASEAN have also become major platforms through which collaboration is formalised. Since 2015, some 17 states have joined the initiative, with at least 33 more (or their subnational governments) signing relevant agreements with China. Multilateral and regional organisations, not least ASEAN, have become major platforms through which collaboration is formalised.<sup>23</sup> See Figure 2.



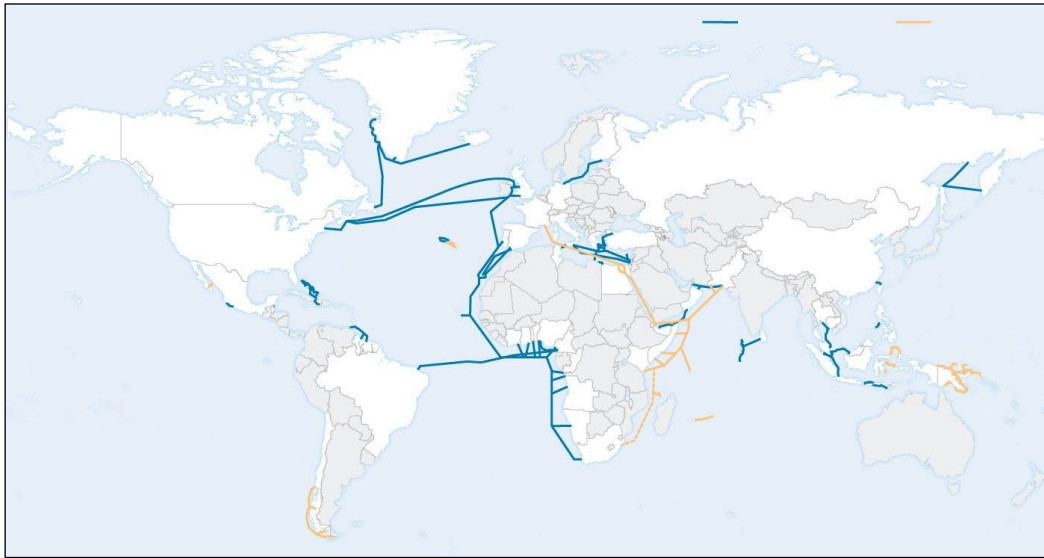
5.4 Efforts have also been concentrated on expanding fibre optic cables installed by China as terrestrial connections across Eurasia and undersea in the Indian Ocean and the Pacific Ocean. Huawei Marine Networks Co, with the majority of shares owned by Huawei Technologies, has worked on some 90 projects to build or upgrade submarine cables around the world.<sup>24</sup> Completed and planned cables laid by Huawei Marine Network are shown in Figure 3.

<sup>22</sup> Wang Xiaohong, “Building an e-Silk Road”, *China Daily Global*, 17 March 2021. <http://www.chinadaily.com.cn/a/202103/17/WS60514b81a31024ad0baaf9bf.html> (accessed 1 July 2021).

<sup>23</sup> “BRI goes digital”, *China Policy*, 22 January 2021. <https://policync.com/21-01-22-bri-goes-digital/> (accessed 24 July 2021).

<sup>24</sup> Jeremy Page, Kate O’Keeffe and Rob Taylor, “America’s Undersea Battle With China for Control of the Global Internet Grid”, *Wall Street Journal*, 12 March 2019. <https://www.wsj.com/articles/u-s-takes-on-chinas-huawei-in-undersea-battle-over-the-global-internet-grid-11552407466> (accessed 24 June 2021).

**FIGURE 3 HUAWEI MARINE'S UNDERSEA CABLE NETWORK**



Source: <https://www.wsj.com/articles/u-s-takes-on-chinas-huawei-in-undersea-battle-over-the-global-internet-grid-11552407466>. (accessed 11 June 2021).

5.5 One of the Chinese cables expected to be completed in 2021 is the 7,500 miles long Pakistan East Africa Connecting Europe Cable (PEACE) which links China with Pakistan by terrestrial fibre optic cable, and from Pakistan undersea to Marseille in France and several countries along the African East Coast (shown as a yellow line on map in Figure 2).<sup>25</sup> This PEACE connection is expected to carry a large bandwidth of internet traffic between China and Europe, while providing essential fast internet connections to Africa. However, it appears unlikely that the cable will be used by major US platforms such as Google or Facebook, on account of the US-led boycott of many Chinese telecommunications equipment makers, including Huawei.

5.6 Another important component of the DSR is connecting the world with Chinese satellite systems, to expand additional communication channels, provide global location services that do not depend on the US-operated GPS and ultimately increase the popularity of the BeiDou Navigation Satellite System. Most smartphones sold in China are now using the Beidou system for location services, including recently

<sup>25</sup> Helene Fouquet, "China's 7,500-Mile Undersea Cable to Europe Fuels Internet Feud", Bloomberg, 5 March 2021. <https://www.bloombergquint.com/businessweek/china-s-peace-cable-in-europe-raises-tensions-with-the-u-s> (accessed 24 June 2021).

the iPhone 11 model.<sup>26</sup> One report has indicated that capital cities for 165 of 195 major countries are observed more frequently by Beidou satellites than by GPS, and the system has become popular in many countries in Central Asia, South Asia and Africa.<sup>27</sup>

5.7 China is also using its capabilities in space technology to add Earth observation services as a new digital benefit offered in particular for DSR countries to promote surveillance and big data analysis to address challenges of environment, natural resources, together with disaster assessment and mitigation through the Digital Belt and Road (DBAR) project.<sup>28</sup> In this way, China offers international scientific cooperation and joint actions for sustainable development, which will address issues of sustainability that have received less attention so far in the development history of Central Asia and other BRI regions.<sup>29</sup>

5.8 The expansion of digital infrastructure along the DSR countries has also allowed China to use “soft” power means such as expansion of infection tracking and monitoring systems, together with vaccine supply to prevent the spread of COVID-19. A new “Health Silk Road” has now emerged, providing vulnerable BRI countries with testing and surveillance equipment, while vaccine makers Sinopharm and Sinovac are already delivering millions of doses everywhere from Indonesia to the United Arab Emirates.<sup>30</sup>

---

<sup>26</sup> “Most smartphones in China using Beidou system for location and navigation”, *Global Times*, 6 August 2020, <https://www.globaltimes.cn/content/1196983.shtml> (accessed 25 June 2021).

<sup>27</sup> “In 165 countries, China’s Beidou eclipses American GPS”, *Nikkei Asia*. <https://asia.nikkei.com/Spotlight/Century-of-Data/In-165-countries-China-s-Beidou-eclipses-American-GPS> (accessed 28 June 2021).

<sup>28</sup> “DBAR Initiative: Big Earth Data for “Belt and Road” Development”. [http://english.cas.cn/bcas/2016\\_2/201607/P020160722472279008627.pdf](http://english.cas.cn/bcas/2016_2/201607/P020160722472279008627.pdf) (accessed 28 June 2021).

<sup>29</sup> Huadong Guo et al., “The Digital Belt and Road program in support of regional sustainability”, *International Journal of Digital Earth*, 2018, vol. 11, no. 7, 657–669; Hepeng Jia, “Scientific collaborations shine on Belt and Road”, *National Science Review*, 4: 652–657, 2017.

<sup>30</sup> “Coronavirus Hasn’t Killed Belt and Road”. <https://foreignpolicy.com/2021/01/06/coronavirus-hasnt-killed-belt-and-road/> (accessed 30 June 2021).

## Supporting China's Digital Industrial Policy

- 6.1 The DSR has been interpreted as a way for China to shift its BRI priorities for expensive, large projects of physical infrastructure construction, of which some have already landed poor countries in a “debt-trap” and costing China a loss of prestige and occasionally financial default on loans.<sup>31</sup> The export of digital technologies to BRI countries provides a cheaper option to address a current infrastructural need in many countries, since many have suffered from a “digital divide” gap with advanced countries during the expansion of the global digital economy.
- 6.2 Thus, the DSR constitutes a valuable extension of the existing digital industrial policy in China. This policy emerged in the 1990s when the sales of future telecommunications giants Huawei and ZTE were growing rapidly, largely on the demand for advanced telecommunications in China's domestic economy and a range of developing countries in Asia and Africa. During the last two decades the Chinese policies have accelerated the digital transformation of China, with the emergence of internet platform/firms such as Baidu, Alibaba and WeChat.<sup>32</sup>
- 6.3 By now, strategic and frontier sectors of digital infrastructure, including artificial intelligence and semiconductors, have been included in China's 14th Five-Year Plan to mobilise a variety of economic actors with new instruments of innovation policy. The emerging Chinese innovative capabilities supported by government programmes and indigenous research and development underscore the ambition of Chinese leaders to become a global technological power.<sup>33</sup>
- 6.4 In this context, the exports to DSR countries of optical fibre communications, 5G mobile phone networks, cloud computing facilities and various types of surveillance

---

<sup>31</sup> “Brief: Public Debt in the Belt and Road Initiative (BRI) — How Covid-19 has Accelerated an Ongoing Problem of China's Lending”. <https://green-bri.org/public-debt-in-the-belt-and-road-initiative-bri-covid-19/> (accessed 30 June 2021).

<sup>32</sup> Qian, Jiwei and Erik Baark, “Automation, Rise of the Digital Economy and Implications for China's Labour Market”, EAI Commentary No. 21 (November 2020).

<sup>33</sup> See Erik Baark, Bert Hofman and Jiwei Qian (eds), *Innovation and China's Global Emergence*, National University of Singapore Press, 2021.



equipment with features such as face recognition create useful opportunities for China's advanced technology to be tested abroad. Indeed, the expansion of international exports and networks constitutes a central component of the "dual circulation" strategy promulgated by the Chinese leadership in May 2020; this strategy envisions a reliance on growing innovative capabilities to meet domestic demand, coupled with continued openness to the international markets. The DSR forms a key link in such international "circulation".

### **China's International Technology Expansion**

- 7.1 Where the United States and its allies are boycotting attempts by China to challenge the current structure of international technological dominance and, in particular, seeking to undermine the newfound Chinese capabilities in digital technologies, the efforts of Chinese firms and policymakers to influence international standards and build a DSR have engendered a substantial literature of analysis and assessment.
- 7.2 A good point of departure is an anthology of papers that address political and economic aspects of the BRI from the perspective of a new era of global economic leadership, or "Globalisation 5.0".<sup>34</sup> The concluding chapter raises the key issue:

BRI is among the largest and most important global institutions affecting the world in the twenty-first century. China's leadership will be tested through the BRI. The tacit social contract behind the FTAs, finance arrangements, and the BRI with China will be challenged. The BRI has already been challenged by many liberal countries, and public opinion is critical on issues relating to politics, society, and the economy.
- 7.3 In the case of the DSR, the reception of the expanding technological infrastructure constructed by China has involved similar issues.
- 7.4 The Chinese ability to reach technological frontiers in digital industries and services has enabled the country to claim a new position in international trade, leaving behind the image of a "Factory of the World" based on foreign designs and cheap labour, to increasingly occupy a new geopolitical status of innovation champions that

---

<sup>34</sup> Wenxian Zhang, Ilan Alon and Christoph Lattemann (eds.), *China's Belt and Road Initiative: Changing the Rules of Globalization*, Palgrave Macmillan, 2018.

challenge incumbents from advanced industrialised countries. In particular, telecommunications firms such as Huawei and ZTE have built core digital infrastructure, mobile 5G networks and facial recognition surveillance systems in DSR countries. A typical example is the involvement of Huawei and Henan Costar Group in establishing a “safe city” and “smart city” network in Uzbekistan where Huawei is simultaneously involved in developing 5G facilities for Uzbekistan’s telecom firms.<sup>35</sup>

7.5 The digital service trade in China grew from US\$200 billion in 2015 to US\$272.2 billion in 2019, rising from 31% of the total volume of the service trade to 35%. At the same time, the total value of Chinese exports of digitally delivered services grew from US\$93.3 billion in 2016 to US\$131.4 billion in 2018.<sup>36</sup> Alibaba and other internet service firms have expanded their network of cloud computing centres in DSR nations, and through acquisitions, they have been able to offer e-commerce and payment services.

7.6 With the diffusion of Chinese standards for e-commerce, fintech, surveillance and data exchange, some have interpreted China’s exports of technologies and services in DSR as a global disruptive force. Recent diplomatic and economic ties with DSR has served to boost China’s export of digital surveillance technologies to countries that seek to fight COVID-19 by monitoring quarantines and populations in an effort to safely restart local economies.<sup>37</sup> Such exports of Chinese technology raises concern by governments in the United States and Europe, further aggravated by networks of facial recognition software installed by Huawei as part of its Safe Cities technology utilised by more than 230 cities worldwide in 2019.<sup>38</sup>

---

<sup>35</sup> Umida Hashimova, “China Dominates Digital Infrastructure in Uzbekistan”, *The Diplomat*, 28 June 2019. <https://thediplomat.com/2019/06/china-dominates-digital-infrastructure-in-uzbekistan/> (accessed 1 July 2021).

<sup>36</sup> Wang Xiaohong, “Building an e-Silk Road”, *China Daily Global*, 17 March 2021.

<sup>37</sup> “The great instability of digital disruption (I): China’s digital belt & road initiative”. <https://china.bnpparibas-am.com/2021/02/18/the-great-instability-of-digital-disruption-i-chinas-digital-belt-road-initiative/> (accessed 3 July 2021).

<sup>38</sup> Richard Ghiasy and Rajeshwari Krishnamurthy, *China’s Digital Silk Road: Strategic Implications for the EU and India*, Institute of Peace and Conflict Studies and Leiden Asia Centre, August 2020. [http://www.ipcs.org/issue\\_select.php?recNo=6153](http://www.ipcs.org/issue_select.php?recNo=6153) (accessed 3 July 2021).

- 7.7 Many reports have emphasised the perceived geopolitical consequences and security issues that the DSR and China’s technology exports entail.<sup>39</sup> The reactions so far among the countries that have imported Chinese equipment and received Chinese technology-based investments have varied, and a recent analysis found that in a case study of five countries that were recipients of largely the same diversity and scale of Chinese technological investments, government responses to the campaign by the United States to further restrict Chinese technologies in national ecosystems were diverse, and that security concerns were no more decisive than commercial considerations.<sup>40</sup>
- 7.8 The Clean Network programme initiated in 2020 was the Trump administration’s approach to safeguarding US and allies’ networks “from aggressive intrusions by malign actors, such as the Chinese Communist Party”.<sup>41</sup> This approach has alerted many nations and firms to these risks, but does not appear to have substantially held back the Chinese initiatives under the DSR.
- 7.9 One issue that has been raised by many observers, however, is the risk of a global digital bifurcation resulting from the current strategic technological conflict between the United States and China. With the diffusion of digital technical standards originating in China and the increased dependence on Chinese digital networks, the world could witness a future split between a US-led coalition of champions of Western telecommunications, internet and software, and a Chinese coalition of DSR standards and networks.
- 7.10 Time will tell whether Chinese influence on digital standards and technologies will become the basis for additional progress and collaboration rather than the

---

<sup>39</sup> For example, Clayton Cheney, *China’s Digital Silk Road: Strategic Technological Competition and Exporting Political Illiberalism*, Pacific Forum, *Issues & Insights*, Vol. 19, WP8, July 2019; and Pointe Bello, *The Digital Silk Road Initiative: Wiring Global IT and Telecommunications to Advance Beijing’s Global Ambitions*. January 2019. <https://a.storyblok.com/f/58650/x/bb4f38245b/pointe-bello-digital-silk-road-2019.pdf> (accessed 3 July 2021).

<sup>40</sup> Meia Nouwens, *China’s Digital Silk Road: Integration into National IT Infrastructure and Wider Implications for Western Defence Industries*, The International Institute for Strategic Studies, February 2021. <https://www.iiss.org/blogs/research-paper/2021/02/china-digital-silk-road-implications-for-defence-industry> (accessed 3 July 2021).

<sup>41</sup> <https://2017-2021.state.gov/the-clean-network/index.html> (accessed 3 July 2021).

bifurcation predicted by observers. At the moment, the claim for mutual trust and benefits so often proposed by Chinese leaders appear to fall on deaf ears in advanced countries where the suspicions regarding security and privacy still command caution. In contrast, developing countries continue to appreciate the benefits of the Chinese digital infrastructure offered and appear less concerned about possible security risks, which they may argue exist as well in systems developed or operated by US firms or government agencies.