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China's Role in Digital Standards for Emerging Technologies – Impacts on the Netherlands and Europe

Julia Voo & Rogier Creemers | May 2021

Summary

The growing presence of Chinese businesses and governmental actors in international technical standardisation processes is attracting growing attention, and in some cases concern, from Western observers. Standards have become an important issue in the emerging global confrontation over digital technology, driven to a significant degree by China's stated aspirations in this field. However, the field of digital technical standards is complex: standards are developed in many organisations, involving multiple corporate participants as well as governmental actors. Evaluating China's actual influence therefore requires a nuanced and more detailed understanding. This report provides an initial survey of the field. First, it reviews the organizational architecture of the international standards-setting landscape, and identifies the ways in which China has sought to build a greater impact. Second, it discusses the processes surrounding the development of the 5G standard, and Chinese companies' participation, as well as China's much-discussed "new IP" initiative. Lastly, it identifies potential security considerations arising from greater Chinese participation, and provides recommendations to respond to them.

Introduction

As part of its strategy to become a "cyber power" (*wangluo qiangguo*), the Chinese leadership has decided it aims to play a bigger role in the realm of global technical standards. This is not a new ambition: already in 2006, China's State Council had stated its intention to *"take an active part in international efforts for standards development and strive to make our country's technology standards international standards"*[1].
Early attempts at realizing these objectives have not been very successful. Telecommunications standards such TD-SCDMA or WAPI have never taken off internationally, for instance. However, over the past few years, China has intensified its efforts to grow its impact on the formation of digital standards. It is currently drafting a national standardization strategy based on the "China Standards 2035" research project. This is only the newest addition to a long-standing succession of incrementally developing plans and steps to pry open a space for Chinese businesses and researchers, technologies and officials. These include measures aimed at strengthening the underlying technology base, such as subsidizing patent applications, research and development, and government procurement, as well as measures targeting standard-setting organizations and processes themselves. Beijing has, for instance, successfully attempted to position Chinese nationals in positions of authority within several standards development organisations, such as the International Telecommunications Union (ITU). It has also sponsored and hosted conferences of these organizations. The Digital Silk Road, the technological component of China's flagship foreign policy project, the Belt Road Initiative, aims to create both markets for Chinese standard-based products, and partners for cooperation.

These policies have caused growing concern among Western governments, businesses and observers. The importance attached to standardization, particularly in the digital realm, has increased drastically as China's global footprint in this area has grown. As tensions between the West and China are intensifying, standards have come to be seen as a source of strategic risk or threat to Western states, or to the sustained existence of a perceived stable status quo in the digital sphere. Huawei's leadership in 5G has become the most prominent symbol of a broader concern that Beijing might become more powerful in setting the rules of the digital sphere. However, these risks are often more asserted than they are demonstrated.

This report aims to provide a more detailed and nuanced review of how European observers are to understand the complex and multifaceted process whereby China's government and its companies seek to attain greater influence on international digital

[1] 'National Medium-and Long-Term Program for Scientific and Technological Development (2006-2020).' (State Council of the People's Republic of China, 2006). Page 48.

standards setting processes, and what will its impact be on European concerns and interests? This report provides an initial answer to this question. A first section will discuss the international system for digital standards-setting and its strategic relevance. Second, it will map the extent to which China's government, as well as Chinese businesses, attempt to play a bigger role in these processes, and whether they have the capabilities to succeed in this regard. Second, Third, it will identify potential national and economic security concerns arising from greater Chinese clout, as well as the impact on European commercial interests. A last section will provide recommendations on measures to mitigate such risks and concerns, and identify how European governments can play a relevant, or even leading role in this process.

What are Digital technical standards and why are they important?

Digital technical standards are the technological "recipes" that govern the compatibility and interoperability of information and communication technologies around the world. In understanding how they work, it is important to distinguish technical standards from other forms of normative standards. These might, for instance, promote value-based practices around labour and environmental protection, as well as best or good industry practices in security protection. The focus of this paper is the former.
There are two ways for a technical standard to emerge. Sometimes, standards emerge from below, where a particular product is adopted at such a high volume that it becomes the *de facto* standard, similar to how Google has become the default search engine option for most users worldwide. In some cases (but not all), they are formalized in an SDO. Under such a scenario, a standard approved by national or SDOs gains acceptance in international markets, *de facto* establishing it as an international standard. This is analogous to the "Brussels Effect"[2], whereby the combination of European market power and the generally high regard in which EU rulemaking is held results in European rules having a global impact. The General Data Protection Regulation is perhaps the most prominent example of this in the technology sphere. Most of the time, however, standards are the result of a long process of negotiation and agreement in specialized organizations, resulting in highly detailed technological specifications for users and market operators to follow.

There is no centralized institutional architecture for the formation of technical standards. There are more than 200 standards development organizations (SDOS) working on technical standards for information and communication technologies.[3] Some of them are governmental or intergovernmental organizations, such as the International

[2] Bradford, A., "The Brussels Effect" *Northwestern University Law Review* 107. No.1 (2016) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2770634
[3] Schneiderman, R., (2015). *International Standards Development Organizations Defined*. John Wiley and Sons, p253.

Telecommunications Union, which oversees telecommunications standards, while others, such as the European Technology Standardization Institute (ETSI) are closely associated with governments. The vast majority, however, are private sector-driven consortia organized by digital businesses or technology expert communities, sometime working together with governmental institutions. These include the Internet Engineering Task Force (IETF) and the 3rd Generation Partnership Project, who have developed the standards underpinning the Internet Protocol and successive generations of mobile connectivity respectively.

The process of laying down standards or selecting one existing one over another in a specific context, has always been political. While standards are often held to embody optimal engineering decisions, these decisions are made on the basis of choices and trade-offs which may imply economic or social consequences, or reflect the interests of the stakeholders involved. In other words, technical standardization "is an intensely political process, even if the politics may be hidden beneath a veneer of technical rhetoric".[4] This political nature of the standardization power is gaining greater political prominence worldwide, as technological competition between China, the US and the EU has reached new heights. This leads governments to more closely examine the levers that influence the proliferation of technology, ranging from the early stages of research and development, to standardization, to market adoption. This comes after years of comparative complacency. Market-fundamentalist ideas and decades of Western technological dominance has meant Western policymakers, including European ones, have not paid sufficient regard to the strategic importance of standardization.

While the primary purpose of standards is to foster technological interoperability, and thereby increase efficiency through economies of scale, they also have wider strategic resonance. First and foremost, the inclusion of a company's patents in a standard generates a potentially significant revenue stream through licensing fees. These, in turn, potentially enable the company to invest in sustained research, development and innovation, enhancing their competitive position[5]. Second, standards can create path dependencies that companies supplying significant proportions of the underlying technologies are well-positioned to exploit. Companies whose technology isn't included in the standard may need to adapt their products in a costly manner to remain relevant in the marketplace. Governments may set national standards in order to regulate access to their marketplace, and privilege national companies. However, that may come at the cost of cutting off these domestic players' global access. Engineering

[4] Loya, T., and Boli, J. (1999). Standardization in the World Polity. Technical Rationality over Power, in: Boli, J., and Loya, T., (eds.) *Constructing World Culture*. Stanford: Stanford University Press, p188.
[5] It must be noted that in a few cases, fees have explicitly not been charged in order to ensure broad spread of the technology. Very relevant to this report is the case of the IETF, who manages the Internet Protocol not to increase revenue, but to encourage universal adoption and compatibility.

choices made in standard-setting may have political consequences. The Wi-Fi standard for mobile Internet, for instance, has slightly worse performance but greater privacy protections than the competing WAPI standard[6]. Lastly, as governments worldwide have come to see digital technology as a flagship of their greater socio-economic prowess, participation in standardization processes results in considerable prestige. These elements create strong incentives for China's government, as well as Chinese technology businesses, to seek greater participation in the setting of international technical standards. On the economic side, it would embed Chinese-held intellectual property rights in broadly used technological applications, providing new sources of export income as the country moves up the value chain and away from low-cost manufacturing. In a longer-term, strategic perspective, embedding Chinese technologies in international standards means it will be far more difficult to constrain China's presence in the global digital economy, and creates international stakeholders in the success of Chinese businesses. Quite a few Western observers have also noted that China seeks to use the standards system to rewrite the rules of the digital sphere, and export its model of digital authoritarianism. This is a more tenuous claim, which will be addressed below. To do so, it is first necessary to survey how Chinese actors have enhanced their participation in international standardization organizations and processes.

How do Chinese governmental and commercial actors seek greater influence in digital standards setting bodies and processes?

To understand the context in which Chinese participation in the global standardization system has evolved, it is first necessary to sketch the domestic context. In China, as in the EU, standard-setting in China consists of both voluntary and mandatory processes, as well as state-directed and private sector-run organizations. However, one major difference is that China has a much more state-driven industrial policy, which includes ambitions in the realm of standards. For the Chinese leadership, technical standards are a means through which it can implement industrial policies, with priorities including a rise in product quality, and assisting local businesses in climbing the ladder to greater innovative prowess through strengthening process-related skills. In this sense, technical standards are aimed at incentivizing compliance and cooperation with the CCP's industrial policy goals as well as a tool for enhancing compatibility and efficiency.[7] China has also sought to use regulatory means to mandate the adoption of indigenously developed standards, such as the WAPI and TD-SCDMA standards for telecommunications, and the CVD standard for hardware carriers.

[6] In general, on the strategic relevance of digital standards, see Ruhlig (20210
[7] Ruhlig, T. (2020). *Technical Standardization, China and the Future International Order.* Heinrich Boll Stiftung E-Paper. p18.

These efforts have, however, not always led to widespread take-up of those standards, illustrating the limits the Chinese government faces in forcing desired market outcomes. Moreover, mandating the use of indigenous standards may have raised costs and reduced international market access for Chinese businesses. Recognising this, the State Administration for Market Regulation issued draft regulations[8] stating that domestic standards should be based on international ones, as well as guidelines[9] promoting simultaneous domestic and Chinese-initiated international standardization projects.

Furthermore, many incentive schemes to push greater contributions to standardization processes reward quantity over quality, or effort over outcome. For instance, Article 9 of the 2017 Standardization Law of China states that "commendation and reward shall be given to the unit or individual who made remarkable contribution to standardization work in accordance with relevant provisions of the State ".[10] The CCP provides financial incentives simply for filing a standards application regardless of whether the standard is adopted[11], as well as for filing patents. This may result in misallocation of resources in search of government support rather than an actual qualitative upgrade in industrial innovation capacity.

Standardization institutions have thus been used as a means to mobilize Chinese companies and coordinate their efforts. As a result, unlike in Europe, many standardization organizations in China prioritize domestic participation, resulting in hurdles for foreign businesses. One illustration of this is the "National Information Security Standardization Technical Committee", also referred to as TC260. This Committee includes dozens of foreign companies in its working groups. Nestle, Bosch, Volkswagen, Siemens, and Nokia have representatives in TC260 working groups. However, earlier research suggests their influence is limited. In some cases, standardization initiatives have been moved to domestic-only working groups where the exclusion of foreign businesses was desired[12]. Analysis of the standards TC260 developed show that only four have been released with acknowledged input from foreign companies.[13] Unsurprisingly, leading Chinese technology companies dominate, with Alibaba and Huawei having contributed the majority of the input in the TC260 standards that have

[8] 市场监管总局关于《国家标准管理办法（征求意见稿）》公开征求意见的通知

[9] 国家标准化管理委员会关于印发《国家标准采用国际标准工作指南（2020 年版）的通知

[10] Betty Xu, 'English Translation of the Standardization Law of People's Republic of China' (Seconded European Standardization Expert in China (SESEC), 10 November 2017). Page 3.

[11] Seaman, J., 'China and the New Geopolitics of Technical Standardization'. *French Institute of International Relations* (2020)

[12] Sacks, S., "China's Emerging Data Privacy System and GDPR", *CSIS* (2018) https://www.csis.org/analysis/chinas-emerging-data-privacy-system-and-gdpr

[13] Wang, C., "Here's Who has the Ear of China's Most Active Cyber Regulator", *Protocol* (2021) https://www.protocol.com/china/tc260-china-cyber-regulator-companies#toggle-gdpr

been released to date. Conversely, even though Minister Zhi Shuping identified "*"to actively participate in international rules and standards making in cyberspace, so as to improve discourse and China's influence and increase international adoption of Chinese standards and innovation with self-owned IP"*[14] as one of TC260's major tasks, there is little reporting available about the extent to which it actually takes part in these processes.

At the international level, influencing global standards one part of China's longer-term goals of becoming a cyber superpower. Both governmental and corporate actors have sought to expand their influence in standardization bodies and processes through various means. Outside of the remit of this study, but perhaps most importantly, Beijing has sought to create conditions for the technological advancement of its digital businesses, through direct subsidies as well as other industry policy measures including infrastructure construction, government procurement and greater inputs in research and education. More directly, Beijing has attempted to raise the number of Chinese participants in SDOs, particularly in senior positions, and provided funding for standardization-related events and conferences.

Increased personnel participation

In its bid to raise Chinese participation in SDOs, China has focused first of all on the large governmental and non-governmental organizations that have traditionally dominated the technology landscape, such as the ITU and the International Organization for Standardization (ISO). In this, it has had quite some success. In the telecommunications section of ITU (ITU-T), the number of Chinese delegates is second only to the US, and ahead of Japan. [15]

Table of Current ITU Membership by Country:[16]

	US	**China**	**Japan**
Sector and Academia	41	46	30
Associates	45	24	9
Total~	86	70	39

To be sure, membership numbers by themselves to not automatically translate to qualitative influence. Within working groups, Chairs and Vice-chairs carry more influence than ordinary members. On this metric, China has comparatively less influence than raw numbers suggest. In key working groups in the ITU, Korea and Japan outweigh

[14] *United States Information Technology Office* http://www.usito.org/news/tc260-new-committee-opened-foreign-participation
[15] https://www.itu.int/online/mm/scripts/gensel11.
[16] https://www.itu.int/online/mm/scripts/gensel11. Sector members and academia can access all ITU-T study groups and the full range of ITU-T activities; associates can only participate in one study group.

China. The Joint Technical Commission (JTC) of the ISO and the International Electrotechnical Commission (ITC) was established in 1987 to facilitate the creation of market-driven, voluntary standards for information technology. Of its 22 sub-committees, the US leads seven, Japan five and China none as of January 2020. On the contrary, reflecting the prowess that Chinese companies have developed in mobile telecommunications, Chinese representatives occupied 9 of the 53 chair or vice-chair positions in the 3GPP partnership in December 2012. This number grow to 11 of 58 positions in December 2017[17]. Furthermore, on the whole, these Chinese participants are rapidly growing in competence. Illustratively, in a report to the US-China Economic and Security Review Commission in 2014, "China's international negotiators are becoming more adept than those in the US. It is therefore no longer clear whether the US would prevail against Chinese efforts in cases of standards disputes at the international level".[18]

In some contexts, Chinese presence at the working level has grown substantially. In the ITU, much of the preparatory work occurs in Study Groups (SGs), subordinate to its different sectors. The Telecommunications sector currently oversees 11 SGs. There is at least one Chinese member in the management team of all but one of these, in some cases from a governmental or semi-governmental background, in other cases with a corporate position[19]. These SGs work through formulating responses to official Questions, with a small team of editors taking responsibility for individual projects[20]. It is here that, in some cases, Chinese presence is preponderant. For instance, SG16 is responsible for multimedia, and has been presented with 14 Questions. Chinese individuals are either rapporteur, associate rapporteur, or both, for six of these. Question 12/16 is one of these, and addresses visual systems and services. 12 Work Items are ongoing to respond to this question, with titles such as "Requirements for face recognition application in visual surveillance systems". Chinese individuals constitute the editorship for all of them[21]. A similar situation is present in several other SG16 questions. While it must be underlined that this work does not automatically lead to the adoption of technical standards, it is clear that this gives Chinese businesses, research bodies and government departments involved a prominent role in framing the parameters for standardization processes.

[17] 2018 Annual Report to Congress (2018) https://www.uscc.gov/annual-report/2018-annual-report-congress
[18] Breznitz and Murphree, 'The Rise of China in Technology Standards: New Norms in Old Institutions' *U.S.-China Economic and Security Review Commission* (2013). Page 7.
[19] ITU-T Study Groups (Study Period 2017 – 2020) https://www.itu.int/en/ITU-T/study-groups/2017-2020/Pages/default.aspx
[20] Gamito, M.C., "From Private Regulation to Power Politics", *SSRN* (2021)
[21] ITU-T Work Programme https://www.itu.int/ITU-T/workprog/wp_search.aspx?sp=16&q=12/16

China's greater bid for participation has been perhaps most visible at the senior level. Chinese experts have held top positions in the ITU, ISO, IEC for most of the past decade. In 2015, Zhang Xiaogang was elected for a three-year term as the president of the ISO. Shu Yinbiao was elected to serve as the President of the IEC in 2019 after having served as Vice President the preceding five years. In the same year, 2019, Zhao Houlin will start his second term as Secretary General of the ITU after having served as Deputy Secretary General from 2007-2015. [22]

It is difficult to provide a blanket assessment of the strategic impact for China of these appointments. Shu and Zhang had both held senior positions in major SOEs: The State Grid and Angang Steel respectively. Zhao, in contrast, only held a minor engineering position at the Chinese Ministry of Post and Telecommunications in the 1980s. He has worked for the ITU continuously since 1986, holding a succession of increasingly senior positions, including Deputy Secretary General[23]. Furthermore, they have been elected by their peers, possess strong technical qualifications, and have remained scandal-free. However, their Chinese nationality means their decisions may face more scrutiny. For instance, in 2017, under Zhao's leadership, the ITU signed a letter of intent at the first Belt and Road Forum in Beijing, which concerned cooperation on telecommunications infrastructure[24][25]. Subsequently, the ITU was reported to cooperate with China's ExIm Bank on communications networks constructions in connection with the Belt-Road Initiative[26]. Zhao has also advocated in favour of Huawei in the context of increasing tensions with the United States[27]. For some, this is evidence of "corruption", and Zhao's failure to act as a proper international civil servant[28]. However, a key ITU mandate is to bridge the digital divide confronting the developing world, and China has done much to supply equipment and infrastructure to developing countries. Similarly, his defence of Huawei could equally be seen as a defence of the ITU-led process for 5G standardization: if the inclusion of Huawei would result in lower-quality standards, it would trigger criticism of the overall process.

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[22] Seaman, J. (2020), 'China and the New Geopolitics of Technical Standardization'. *Notes de l'Ifri*. Issue 34, p20-21.

[23] "Biography of Houlin Zhai, ITU Secretary-General", (2021) https://www.itu.int/en/osg/Pages/biography-zhao.aspx

[24] "The Belt and Road Initiative: Progress, Contributions and Prospects", available at: http://www.china-un.ch/eng/zywjyjh/t1675564.htm

[25] Kong, W., "ITU Vows to Join Hands with China", *China Daily* (2019) http://www.chinadaily.com.cn/a/201904/24/WS5cbfbb1aa3104842260b7f2f.html

[26] Liu, X., "ITU Secretary-General: BRI Helps Narrow World Digital Divide", *CGTN* (2019) https://news.cgtn.com/news/3d3d674e31597a4d34457a6333566d54/index.html

[27] Miles, T., "Huawei Allegations Driven by Politics Not Evidence", *Reuters* (2019) https://www.reuters.com/article/us-usa-china-huawei-tech-un-idUSKCN1RH1KN

[28] Schaefer, B.; Cheng, D.; Kitchen, K., "Chinese Leadership Corrupts Another U.N. Organization" *Heritage* (2020) https://www.heritage.org/global-politics/commentary/chinese-leadership-corrupts-another-un-organization

At the same time, China is nearly completely absent from those organizations setting the standards for how the Internet functions, such as the IETF and ICANN. There is not a single Chinese member on the ICANN board, nor on the councils of the Supporting Organizations appointing the board. The one exception to this is the Governmental Advisory Committee, where China has a representative just like any other governmental member. In fact, there has only been one Chinese board member throughout ICANN's history, Hualin Qian, who served between 2003 and 2006[29]. At the time of ICANN's transition to multi-stakeholder management, the IANA Stewardship Transition Coordination Group contained one Chinese member, Lee Xiaodong, ICANN's former VP for Asia. In fact, ICANN itself sees the relative dearth of Chinese participants as a situation they would like to rectify[30]. In the IETF, there are no Chinese board members. Only one of its three subordinate organizations, the Internet Architecture Board, has Chinese members on its council[31]. These represent Huawei as well as CNNIC, which runs the Chinese domain name system. Furthermore, one of the four hosts of the World Wide Web Consortium (W3C), which defined standards for Web traffic, is Beihang University in Beijing. However, it thus far has attracted little attention, indicating its functioning has, thus far, not been controversial.

Increased process participation

Although expanding the presence of Chinese individuals in SDOs is important, the final measure for influencing standardization outcomes is by influencing the processes itself. Here, China has shown growing initiative in a range of sectors. Where it comes to the Internet of Things, for instance, over half the standards proposed in the ISO and IEC are Chinese in origin. As early as 2016, Chinese companies had filed over 30 standards proposals with SDOs including 3GPP, IEEE and ITU[32]. These processes take as many different forms as there are SDOs. At the ITU, for instance, members shape the standardization discussion through the submission of written contributions. These contributions can be submitted by individuals ranging from country representatives, to industry, and academia or as a group from the same country or in concert with other countries. An examination of written contributions over the past decade shows that contributions from Chinese delegates in the ITU outnumbers all other countries, although South Korea is a close second[33]. Yet while this is a useful data point to gauge effort, it does not indicate successful take-up of these contributions.

[29] ICANN, https://www.icann.org/
[30] Interview with ICANN staff member, 2019.
[31] IETF, https://www.ietf.org/
[32] "D2.1: Report on Future Internet Research and Innovation Policies and Ecosystems in China", *European Commission* (2017) https://www.euchina-iot5g.eu/wp-content/uploads/sites/27/2018/05/D2.1-Report-Future-Internet-Ecosystem-China.pdf
[33] Voo, J., "Shaping Global Technology Governance", *The Penn Project on the Future of US-China* (2020) https://cpb-us-w2.wpmucdn.com/web.sas.upenn.edu/dist/b/732/files/2020/10/Julia-Voo_Shaping-Global-Technology-Governance_Final.pdf

Contributions proposed to the ITU need to be approved by consensus. In this process, each ITU member state has one vote at Study Group meetings, while other participants, such as academics, associates and industrial participants, do not have a vote. A similar drive towards consensus is present in other SDOs, albeit reflecting each organization's particular culture. In the IETF, for instance, the libertarian background of early Internet pioneers is retained in the principle of "rough consensus and running code". While this practice has been criticised in recent years[34], it nevertheless remains the IETF's standard mode of operations. 3GPP decisions are, in principle, the result of consensus, although its rules also provide for voting processes (with a 71% approval threshold) and "Working Agreements" in the case of non-consensus[35]. This, in and of itself, means it is very difficult for any one country or company to force through standard proposals that meet with any significant level of opposition. To illustrate this point, it is instructive to compare the obvious success of Huawei in becoming a leading contributor to the 5G standards suite with the hype surrounding the "New IP" standard, alleged to replace the currently functioning Internet Protocols.

The Case of 5G:

One of China's greatest successes in the field of digital standardization has been its role in the formation of the 5G standard for telecommunication. This success is, by and large, the merit of one company: Huawei, although ZTE and China Mobile have also provided significant contributions. In fact, according to some metrics, Huawei is the largest single contributor of Standard-Essential Patents (SEPs) to the 5G standard, followed by Sweden's Ericsson and Finland's Nokia, then the US' Qualcomm.[36]

Due to increased communication bandwidth and reduced latency, the 5G standard promises to generate a plethora of new goods, services and business models. If these promises are realized, 5G will form the skeleton of increasingly digitized economies, societies and polities. As such, it will not only generate patent-related income to standard participants for years to come. Major patent contributions also are in a strong position to develop further intellectual property that seeks to leverage basic 5G connectivity for other value-added activities.

Huawei is, in many ways, an unlikely leader. The company has only built up a significant presence in Europe since 2009, when it installed one of the first 4G networks in Norway. Prior to that, it had been seen as a Chinese knock-off. Yet it rapidly gained a reputation as a company that could compete on quality as much as price. Huawei has,

[34] "On Consensus and Humming in the IETF" *IETF* (2014) https://tools.ietf.org/html/rfc7282
[35] "3GPP Working Procedures", (2020) https://www.3gpp.org/ftp/Information/Working_Procedures/3GPP_WP.htm
[36] Hassan, M., Kumar, A., Luby, M., "Who Owns Core 5G Patents" (2020) https://www.greyb.com/5g-patents/

of course, been able to enjoy advantages foreign competitors did not, including generous state subsidies, a cost advantage, protection from foreign competition by Beijing, and a large and rapidly growing developing market. The military background of its founder Ren Zhengfei continues to be cited as an indication the company is close with Chinese armed forces, and much about its relationship to the Chinese state remains vague. But those factors only go so far in explaining its continuing success.

Huawei also invests heavily in R&D, with estimates ranging to 15 billion USD per year, and 80.000 employees involved[37]. It is vertically integrated, being the only company in the world producing an entire stack of telecommunications hardware, including smartphones, at large scale. It became the largest smartphone manufacturer in the world in 2020[38]. It was not a major part of the 3G standard, but grew to a leading role in the 4G standard, where the German intellectual property analysis firm IPAnalytics estimated it contributed around 10% of standards. In 5G, that share has grown to around 15%, with another Chinese company, ZTE, contributing another 12%. In comparison with other leading contributor's, Huawei's share closely outstrips that of Samsung (which grew from 11% to 13%), and more greatly outperforms LG (steady at 11%), Nokia (7,5% to 10%) and Ericsson (6% to 7%)[39]. At the same time, it is necessary to somewhat qualify these bare numbers. Measuring success in standardization is complex, and further research is necessary to evaluate how Huawei's contribution translates, for instance, into financial revenue or follow-on technology developments. Huawei's success was largely a function of considerable investment, not only in financial resources but also in the 5G standards setting process. According to 2019 numbers, Huawei had sent 3098 engineers to attend 3GPP meetings on 5G, and submitted 19473 contributions to the process. This placed it at the top of both rankings[40]. What is unclear, however, is the final monetary value of Huawei's intellectual property share, as much of the royalty fee structure for other companies' access to standard-essential patents either remains confidential or has not yet been set down. Also, not every patent or piece of technology is equally important for the functioning of the standard, and some analysts have suggested that Huawei's contribution is far more peripheral than that of other participants, such as Qualcomm, Nokia and Ericsson[41]. In any case, while

[37] Jiang, S., "China's Huawei to Raise Annual R&D Budget to at least $15 Billion", *Reuters,* (2018) https://www.reuters.com/article/us-huawei-r-d/chinas-huawei-to-raise-annual-rd-budget-to-at-least-15-billion-idUSKBN1KG169

[38] Dayaram, S., "Huawei, OnePlus and Beyond", *CNET,* (2020) *https*://www.cnet.com/news/huawei-oneplus-china-biggest-smartphone-brands-you-should-know-about-lenovo-meizu-xiaomi-oppo-vivo/

[39] Pohlmann, T., "Fact Finding Study on Patents Declared to the 5G Standard", *IPlytics GmbH* (2020) https://www.iplytics.com/wp-content/uploads/2020/02/5G-patent-study_TU-Berlin_IPlytics-2020.pdf

[40] "Who is Leading the 5G Patent Race?", *IPlytics,* (2019) https://www.iplytics.com/wp-content/uploads/2019/01/Who-Leads-the-5G-Patent-Race_2019.pdf

[41] https://www.lightreading.com/5g/huaweis-patents-wont-save-it-says-leading-analyst/a/d-id/761569

Huawei is the undisputed quantitative leader of elements of the 5G standard, its impact, or that of China more broadly, should not be overestimated. The vast majority of the patent stack underpinning 5G is not owned by Chinese businesses, but mainly by South Korean, European and American ones - in that order. Lastly, Huawei's tactics in contributing to the 5G standard must not be seen in isolation, but in the context of a bigger strategy which, in the end, is aimed at building up marketshare for its infrastructure hardware and devices.

The case of New IP:

Huawei's successes in 5G, combined with growing concerns about China's ever-greater international digital footprint, have made the company an attractor for suspicions about Chinese efforts to fundamentally restructure the digital sphere for its own interests. In March 2020, the Financial Times reported that "China" proposed a radical change to how the Internet works[42]. More specifically, it claimed Huawei, together with state-owned telecommunications operators China Unicom and China Telecom, as well as China's Ministry of Industry and Information Technology-affiliated think tank China Academy for Information and Communication Technology had proposed a "new standard" for the addressing system that underpins the essence of Internet communication. Amongst others, this would include a "shut-up command", where a central point in a network could block traffic to and from a specific address. Furthermore, they were allegedly planning to "push through" these standards at an ITU conference later that year. For obvious reasons, this report attracted a considerable amount of political and media attention, leading amongst others to questions being asked in the European parliament[43].

However, as Milton Mueller indicated, this reporting contained grave factual errors in important aspects. Huawei's proposal was not for a technical standard, but for the ITU to start conducting research on possible future network technology in view of the anticipated requirements of emerging technologies. The accompanying technical paper[44] was far from a comprehensive standards proposal. Rather, it was very light on detail, only claiming to reflect initial thinking that would require much work and validation in the future. As such, it did not even address many of the engineering and compatibility challenges that would need to be resolved. The reporting also evinced severe deficiencies of understanding in how Internet-related standardization works. Drafting, developing, testing and implementing a new standard for network traffic takes time. The current version of the Internet Protocol standard, IPv6, was accepted

[42] Gross, A., Murgia, M., "China and Huawei Propose Reinvention of the Internet", *Financial Times* (2020) https://www.ft.com/content/c78be2cf-a1a1-40b1-8ab7-904d7095e0f2; https://www.ft.com/content/ba94c2bc-6e27-11ea-9bca-bf503995cd6f

[43] "Answer Given by Mr. Breton" *European Commission* (2020) https://www.europarl.europa.eu/doceo/document/E-9-2020-002042-ASW_EN.pdf

[44] "New IP Framework and Protocol for Future Applications", *Huawei Technologies,* (2019) *http*://prod-upp-image-read.ft.com/e8dd8c46-70e6-11ea-95fe-fcd274e920ca

in draft in 1998, but took until 2017 to be ratified as a full Internet Standard. Adoption is still slow: in January 2021, only a third of visits to Google's network used IPv6. The technical community, for its part, criticised New IP for identifying problems where considerable efforts are already under way in a range of institutions[45], but particularly in the Internet Engineering Task Force who leads on TCP/IP which the Huawei proposal initially implied it would replace. A similar stream of work in a new SDO would be duplicative and risk incompatibility if widely adopted[46].

The ITU, where the New IP discussion took place, has hitherto not been involved in standard-setting for Internet traffic. This has been the [unofficial] remit of the IETF, but the proposal has not been submitted into its work processes[47]. Furthermore, Huawei acknowledged the existence of the "shut-off protocol", but claimed it is a part of security measures to prevent DDoS attacks and is similar to technologies under development in the US. In Huawei's words, New IP generally "does not define governance models" for the use of technology, or entails centralized, top-down control of the Internet. Regardless of the veracity of Huawei's assertions, even if New IP were to develop into a full-fledged standard, it is highly unlikely that any standard enabling such interventions would be accepted by the governments who participated in the ITU where standards must achieve "consensus", let alone implemented by the thousands of businesses in the technology ecosystem. Finally, New IP is only one of a range of ideas on how to address the new technological needs presented by the Internet of Things. The European Telecommunications Standards Institute recently initiated its own process to develop similar, non-IP technology[48].

The New IP case illustrates two concerns about China's growing participation in digital standards. On the one hand, it reflects a broader trend of alarmism about China's attributed attempt to spread digital authoritarianism. In 2019, the Financial Times reported on the involvement of ZTE, Dahua and China Telecom in the standardization of facial recognition technology at the ITU.[49] It cited a concern that these ITU standards might be developed as policy in developing countries that are signatories to

[45] Sharp, H., Kolkman, O., "Discussion Paper: An Analysis of the "New IP" Proposal to the ITU-T", *Internet Society* (2020) https://www.internetsociety.org/resources/doc/2020/discussion-paper-an-analysis-of-the-new-ip-proposal-to-the-itu-t/.

[46] It bears reminding that duplication occurs frequently in standardization, as different involved parties engage in forum shopping to ensure standards are developed in those environments best suiting their interests.

[47] It must be noted that there are no rules or mechanisms to assign particular standards projects to individual SDOs. Rather, they tend to build up a track record in specific technological areas, which leads to insurmountable incumbency and path dependency.

[48] Antipolis, S., "ETSI Launches New Group on NON-IP Networking Addressing 5G New Services", *ETSI,* (2020) https://www.etsi.org/newsroom/press-releases/1749-2020-04-etsi-launches-new-group-on-non-ip-networking-addressing-5g-new-services

[49] Gross, A., Murgia, M., Yuan, Y., "Chinese Tech Groups Shaping UN Facial Recognition Standards", *Financial Times* (2019) https://www.ft.com/content/c3555a3c-0d3e-11ea-b2d6-9bf4d1957a67

China's Belt and Road Initiative, a concern that has only grown in the light of the Chinese technology sector's well-reported contributions to the targeting of Uyghurs in Xinjiang. However, biometrics standardization has been ongoing in other SDOs for many years. For example, the ISO/IEC joint technical commission has a working group on biometrics led by the American National Standards Institute who have already published 131 biometric standards and have 28 under development.[50] It is very likely that many of these can also be applied in surveillance technologies, or used in discriminatory ways. In other words, not only China is developing tools that might be used for non-democratic purposes, requiring a broader and more nuanced debate.

On the other hand, as John Lee indicates, the New IP case presents a challenge to the institutional politics of Internet standard setting. The Internet was based on principles including universal connectivity and bottom-up permissionless innovation[51]. It is clear that China strives for a more state-centric approach to standard-setting, and as such, it may well be that the reason this proposal was presented at the ITU illustrates an attempt to shift standardization to a venue that China sees as more amenable to its interests. In this sense, it is necessary to note that China's participation in international SDOs, albeit growing, is uneven and selective. Attention has mostly focused on large, traditional industrial SDOs, while individual companies have sought greater presence in the specific circles relevant to their commercial operations. At the same time, there has been little investment in other forums, most notably those influencing network design and traffic routing. One can only speculate about the motivations for this selection. Perhaps the simplest explanation is that Chinese actors generally prioritize developing standards where this may result in commercial benefits, either directly, through royalty fees, or indirectly through the creation of path dependencies. In contrast, the relative lack of initiative in venues such as the IETF or ICANN may suggest that Chinese companies do not see them as conducive to their interests, that Beijing is largely satisfied with their functioning, and does not see them as a conduit to achieve its international aims. Another option is that China attempts to move future processes away from them as it sees little opportunity of influencing them. Further research is required to shed greater light on this question.

How will these efforts impact European security and commercial interests?

It is clear, at the very least, that China's growing clout in the digital realm, of which standardization processes are only the apex, creates rapidly growing competitive pressures on European technical industries. To a certain degree, this clout is the result

[50] "ISO/IEC JTC 1/SC 37 Biometrics", *ISO*, Numbers checked on 31 Jan. https://www.iso.org/committee/313770.html
[51] Lee, J., "Will China Reinvent the Internet?", *The China Story*, (2020) https://www.thechinastory.org/will-china-reinvent-the-internet/

of government support and industrial policies the EU has protested. More broadly, there are multiple risk profiles associated with China's growing ambitions in the area of digital standardization.

Concerns have been expressed that China might use its control over technical standard-setting processes to intervene in or constrain other countries' policy choices against the latter's will. It is also conceivable that China could, echoing US export sanctions, bar Chinese companies from providing standards-essential technologies to foreign businesses, possibly hampering the correct functioning or maintenance of installed network infrastructure or other applications. Alternatively, greater Chinese preponderance in standard-setting might result in economic harm, where block-voting Chinese businesses could direct a greater proportion of licensing fees to themselves, rather than their foreign competitors. Such measures could emerge in a broader context of greater competition in critical technologies, competition over influence in third countries (and particularly the developing world), and escalating tensions in the international system.

China and the EU[52] have both identified sets of technologies where they aspire to global leadership. Unsurprisingly, these lists contain considerable areas of overlap, including artificial intelligence, blockchain, quantum technologies and high-performance computing. In these priority fields, the Chinese government has deployed a range of supporting measures, including R&D and talent investment, acquisition of relevant technologies abroad, and attempts to promote the adoption of Chinese national standards internationally. In these fields, specific risks are complex and difficult to map. This must happen on a case-by-case basis, which will likely combine questions about standardization with broader elements of the debate about technology competition. Relevant questions should include: are there components of this technology that are critical to EU national security and should be sourced solely from the EU or preferred partners? will aspects of the technology need to be interoperable therefore standardisation would be needed?; is leadership in these technologies feasible for Europe?; if yes, how does European research and development in this field compare to Chinese competitors, and what investments might be necessary? The EU should have a thorough understanding of what technologies are most important to its national security, how it compares with competitors, and where it can realistically compete. Armed with this information the EU should ensure that the Europe-wide strategies aimed at driving technological development and adoption in these areas also include a corresponding standards strategy to both influence international standardization of the EU preferred technology and adoption in the market.

[52] "Shaping Europe's Digital Future", *European Commission,* (2019). https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/shaping-europe-digital-future_en

Furthermore, China's approach to technological diffusion is increasingly well-developed. While the Belt-Road Initiative, and the associated Digital Silk Road, are often little more than policy buzzwords, it is certainly the case that China provides compelling offers to emerging markets to install Chinese telecommunications networks and other critical digital infrastructure. Chinese consumer devices and IoT devices equally have seen their international market skyrocket. This has likely already created natural path dependencies, and will continue to do so in the future. In other words, the adoption of current Chinese technology drives future purchases of interoperable or compatible equipment from the same vendor. China does not yet have the market power, at home or in combination with friendly nations, to establish domestic standards as de facto international ones. However, this might change in the future. To the extent that those standards incorporate or facilitate political choices running counter to the Dutch or European values and interests, they might then present an incontrovertible *fait accompli*.

In its conception of the standardization system, China's support for a greater role for the ITU, for instance in Internet addressing, resonates with the interests of many developing countries. Many SDOs are multi-stakeholder or industry-led, leading to a lack of representation for these countries who believe the organizations do not always have their best interests at heart. In its defence of multi-stakeholder or industry-led standardization processes, the EU and individual European governments must take into consideration that the vast majority of developing countries have little technical expertise, as well as in navigating incumbent SDOs. These are nominally open to all, but so is the Ritz. This might result in greater support for Chinese, state-centric politics, to the detriment of European interests and preferences.

How can these risks be mitigated, and what is the role European governments can play in this?

In response to the challenges China presents in standardization, it is necessary to caution against excessive alarmism, and identify constructive policies that can be implemented at the national and European level to strengthen competitiveness and efficacy. The complexity of the institutional landscape for standardization, the underlying technological choices and engineering trade-offs, as well as the industrial and political context in which this takes place means it is difficult, if not impossible, to assess risks and mitigation methods in a general sense. Rather, they must be approached on a case-by-case basis, which often might even entail firm-level analysis. Nevertheless, it is possible to outline several categories and practical measures European governments, or the European Union, could consider.

International SDOs

First, most of the standards of significant importance to Dutch and European interests are produced by international SDOs. This, in and of itself, tends to provide significant safeguards against unilateral or aggressive action from the Chinese side, as long as these organizations function effectively. While China's technological clout has undoubtedly grown, it is not currently in a position where its influence is decisive in any major SDO, neither is it likely to acquire that position in the foreseeable future. Furthermore, most technologies that become essential parts of a standard are patented, meaning their functioning has been disclosed. SDOs routinely require patent-essential technologies to be made available broadly on the basis of FRAND (fair, reasonable and non-discriminatory) terms. In other words, once a patent belonging to, for instance, Huawei becomes part of a standard like the 5G one, its technology immediately becomes available to anyone using the standard on a fee-paying basis. Also, there is a difference between standards contributions and product sales: while some Huawei intellectual property will be present in every 5G device, that presence does not necessitate the installation of Huawei hardware. In the unlikely case the Chinese government were to impose export bans of Huawei technology, governments could issue compulsory licences for the related patents. Lastly, SDOs perform a "peer review" role. While there has always been some political jostling at the margins, these organizations have usually been successful in ensuring the engineering questions underlying new technologies are not manifestly insecure or malfunctioning, and attendant risks are reduced.

European governments would do well, therefore, to ensure the continued correct functioning of these processes. They should be adequately funded, with rigorous oversight and accountability processes. With proper due process and good governance, the potential abuse of leadership positions, held by Chinese individuals or otherwise, would also be rendered far more difficult. European governments should also consider assisting the participation of delegations from third countries, particularly in the developing world, not just as a goodwill gesture but also as a means of ensuring all affected sides are taken into consideration during the standard setting process. European governments could also fund venues or meetings of SDOs, counterbalancing Beijing's appetite for doing so. These steps would require only limited financial resources, but go a long way into ensuring that options to politicize or otherwise unduly influence the standard-setting process would be highly limited. In support of this programme of measures, European governments should develop an overarching strategy on standardization, and coordinate activities at the state and Union level in major organizations such as the ITU, ISO and IEC, and set up a standards monitoring unit to provide a consistent stream of information about ongoing security-relevant standardization processes across the SDO landscape. This could involve both companies that develop these technologies, as well as public bodies or NGOs that often lack technical know-how.

Another oft-cited concern is block voting by Chinese businesses. European governments should bear in mind that European businesses were accused by US institutions of the same practice themselves not that long ago[53]. It is difficult to counteract bloc voting directly, but it raises broader questions about the technological capabilities that enable businesses to come to the table in the first place. If Chinese companies are increasingly able to have their solutions included in technical standards, it is in large part due to the fact that those solutions are actually sufficiently good. This capability to deliver has resulted from decades of Chinese industrial policy aimed at effecting exactly this outcome. While innovation policy falls outside of the remit of this report, it is nevertheless necessary to consider that standardization processes are only the proverbial tip of the iceberg of an enormous and complex economic ecosystem. Potential challenges emerging here must be seen in that context as well.

Export of domestic standards and technologies

As indicated before, China has, so far, been unsuccessful in generating the market success for products carrying domestic standards required to make them de facto international or global standards. However, particularly for new-generation technologies where no incumbent or competing standard currently exists, it is possible that China's digital export initiatives result in growing adoption outside its borders, particularly in countries associated with the BRI.

Here, obviously, European governments can bring little influence to bear in the process of standard setting. Instead, they should focus on creating frameworks to prevent harms and other undesirable consequences resulting from this scenario. It must be remembered here that standards are not laws - they are merely technical specifications. That means potential risks can be addressed through regulation. For instance, if particular Chinese AI ethics standards do not adequately prevent, or even facilitate, various forms of discrimination, are insufficiently secure or deficient in other ways, governments can, and should ensure the products incorporating them are kept out of European markets. Government procurement programmes, in contrast, can be used to create a market for products with preferable standards, making them more competitive.

Yet it is more likely that this trend occurs in the Global South. China's government and its businesses have, over the past decades, strengthened their relationship with numerous countries in Asia, Africa and Latin America, culminating in the ambitious BRI. In this, its stated approach has been based on non-interference, rejecting the criteria of democratization, transparency and human rights protection usually de-

[53] Witte, J.M., "A "Single European Voice" in International Standardization", *American Institute for Contemporary German Studies,* (2003), https://www.aicgs.org/site/wp-content/uploads/2011/10/witte.pdf

manded by Western governments. However much this can be criticized, China's presence in the developing world has become a fact that must be recognised for what it is. In digital affairs specifically, Chinese companies have been highly successful in connecting "the next billion". This is not a surprise. The fact that these businesses emerged in a country that was itself developing prepared them well to operate in other environments with, for instance, a lack of infrastructure, a low degree of technological adoption or capricious governments. Poorer countries often prioritize technical development over political niceties, particularly in relation to former colonizers.

Co-opting the Global South in standards thus requires that Europe takes bolder steps towards prioritizing digital questions in its development aid programmes, and competes more effectively with China's - often very attractive - propositions. In short, Europe should provide better solutions and offers instead of merely complaining about the Chinese ones. The EU has made a few steps in this regard: in 2018, the European Commission presented its Digital4Development policy and launched projects with an EU contribution of EUR110 million to improve people's lives with digital technologies and services. In December 2018, the European Union and the African Union launched a Digital Economy Task Force to explore how to collaborate to strengthen digital economic collaboration through integrating digital markets, boosting public and private investment, and improving the business environment. Standards-related processes must be an integral part of the implementation of these programmes. This can happen through facilitating greater participation from developing countries in SDOs, but also through targeted forms of aid where, for instance, royalty fees are waived for local producers or users of standards-related technologies.

Impact of the scope of standards

Not all standards are created equal, and in conceiving policy responses to Chinese involvement, their potential impact must be taken into account. Some standards are of fundamental importance to the correct function of global ICT networks, most notably those associated with the code layer of the Internet; the Domain Name System and the Internet Protocol. Put simply, without universal application of these standards, the Internet fragments at a technical level. Other standards are of highly significant economic importance, where allowing interoperability creates economies of scale and greater efficiency, which in turn justifies increased investment in ancillary activities. The 5G standard is one important example of this. Universal global adoption of the 5G standard is not fundamentally necessary for basic communication or the correct functioning of mobile networks. Current mobile communications worldwide use mixtures of 4G, 3G and even the old 2G technologies. However, 5G is intended to constitute the material infrastructure for whole swathes for mobile devices and applications, ranging from autonomous vehicles and smart cities to upgraded manufacturing processes and remote healthcare. This will involve trillions of dollars of investment. A globally uniform 5G standard means it will be easier to recoup these investments and thus foster economic growth.

Yet in other areas, there is less urgency for global universal standards. The world still hasn't decided on a single type of plug socket, partially because the cost of adaptation would be too high relative to potential efficiency gains. The further one moves out of the core of network connectivity and functioning and into specific devices and applications, the less critical having global unity becomes. Moreover, it is in these areas where most of the political disagreements within China and Europe are likely to find themselves. Core connectivity standards require a great degree of neutrality in order to gain market acceptance across a broad range of stakeholders; specific ones far less so. For instance, recent reports suggest Chinese companies have developed facial recognition technologies that enable the identification of ethnic Uyghurs[54]. Although these capabilities likely build on China's citizens' registry, which includes information on ethnicity, there are obvious reasons why European governments would be concerned about such capabilities and oppose their application in Europe or elsewhere. Furthermore, divergence on facial recognition does not otherwise imperil the correct functioning of communications networks or digital applications. This drastically changes the cost-benefit context for divergence and enables greater space for political action.

Understanding the nature of technical standards, standardization processes and adoption

Underpinning these recommendations is the point that a great deal more effort must be done among stakeholders and in policy circles to better understand the territory with which standards engage. New IP provides an insightful illustration of how easy it is to get things wrong. Leaving aside the point that the Chinese government has been successfully able to build online content barriers, conduct surveillance, implement censorship and execute targeted Internet shutdowns under the current addressing system, the New IP case demonstrates how concerns about China's emergence as a technology power merge with insufficient understanding of technology as well as existing standardisation processes to produce a misleading picture. This costs political bandwidth that could be put to better use.

Of course, it is important to closely monitor China's ambitions in technological standard-setting. Yet somewhat curiously, Western analysts often manage to underestimate and overestimate the prowess of China's government and its businesses – in many cases at the same time. On the one hand, there is great reluctance to ascribe China's growing technological leadership to anything but technology theft, improper subsidies or other malign conduct. However, a company like Huawei could not have become the largest patent supplier to the 5G standard by cheating alone, neither is this sufficient to explain China's digital leap forward. Public and corporate actors alike are

[54] IPVM Team, "Patenting Uyghur Tracking – Huawei, Megvii, More", *IPVM,* (2021), https://ipvm.com/reports/patents-uyghur

considerably more competent than given credit for. On the other hand, China's ability to influence the conduct of the ultimate consumers of standardized technology products should not be overestimated either. History is littered with technologies that, although standardized, nevertheless fell by the wayside, from Betamax and Minidisc to FireWire. Even if China would want to rule the global technology world through standards, or was able to impose them through SDOs, the ultimate arbiter of a standard's success remains the marketplace. If a standardized technology is suboptimal, insufficiently secure, excessively politicized or simply plain unlucky, consumers will simply take their business elsewhere, provided better options exist. Equally, it is easy to overestimate the impact of policy plans such as "China Standards 2035", which are "part inspirational, part aspirational, and part chest-puffing propaganda[55]". While such documents are useful guides to identify Chinese objectives and measures taken to achieve them, care should be taken not to overly buy into their rhetoric.

Finding a place for Chinese businesses

Whatever risks may arise from China's growing presence in global digital standard-setting must be offset against the risks arising from barring its entry. Attempting to kneecap the development of Chinese technology companies, like the Trump administration did, is likely to be self-defeating. It may also lead to second order and third-order unintended consequences, most notably the damage it does to the complex and intricate ecosystem of the global digital sphere. Regardless of whether such a decision would be legitimate or not, it may result in short-term, tactical gains, but will only spur China to develop autonomous capabilities more quickly, and seek markets for them outside existing channels – including standardization processes. As China grows stronger and more confident, retaliatory measures become more likely. Moreover, in multiple sectors, doing so would also reduce competition, potentially lowering quality and increasing costs to consumers.

The digital sphere is currently undergoing a major reconfiguration. The deep integration of global production and value chains created by the wave of globalization of the 1990s and 2000s is running up against the resurgence of questions concerning national security and autonomy. However, running to the other extreme of full decoupling comes with its own set of risks and costs. Instead, a more measured approach is necessary. It is right for European governments to regulate their markets and protect their societies from actual and potential harm emanating from digital technologies. It is legitimate that they attempt to find a new balance between interdependence (which was often held to be stabilizing, but is now being weaponized on all sides[56]) and reducing

[55] Wilson, N., "China Standards 2035 and the Plan for World Domination – Don't Believe China's Hype", *Council on Foreign Relations*, (2020) https://www.cfr.org/blog/china-standards-2035-and-plan-world-domination-dont-believe-chinas-hype

[56] Drezner, D.W., Farrell, H., Newman, A.L., *The Uses and Abuses of Weaponized Interdependence*, Brookings Institution Press, Washington (2021)

vulnerabilities through reliance on foreign, and particularly, single-supplier technologies. Yet room must be found for Chinese players to contribute to the digital sphere. This naturally will change the status quo, create greater competition for European businesses and cause new headaches for European policymakers. Yet the argument can also be reversed: it provides an opportunity to embed major Chinese players into one important component of the rules-based order that European countries purport to support. They would thus become greater stakeholders in its integrity. Finding this room will require policymakers to drastically increase their understanding of standardization processes as well as the underlying technologies, accurately identify and assess their characteristics and potential impact, and selectively target those areas where intervention is necessary and desirable.

Conclusion

The Chinese pursues a multifaceted approach to expand its global technological footprint, in tandem with Chinese companies and allies. Its primary aim in this regard is assisting the development and growth of Chinese businesses abroad, and more broadly, to create an external environment conducive to achieving domestic policy goals. In comparison, exporting China's digital governance model is far less of a priority. Influencing international digital standards is one component of this strategy. China's broad-spectrum approach is likely to have significant implications for Europe's plans for global leadership in digital norms and standards, as well as strategic autonomy in cyberspace. Building a comprehensive strategy of its own, which leverages the EU's undisputed regulatory power, as well as the capabilities of European states and companies will be critical to shaping the technological sphere in a way that benefits European interests. To this end, greater coordination between all relevant stakeholders is required, amongst others in SDOs where standards for critical technologies are set.

However, the complex landscape of the international standards bodies and processes, as well as the technical subject matter they oversee, creates a fertile landscape for hyperbole about China's actions and influence. There is a risk that this overestimation of China-related risks and threats overshadows important issues concerning the efficiency of the international standardization and European engagement in it. Indeed, the standards-setting system is quite robust against attempts at monopolization by single actors, even though improvements are always possible. Consequently, Europe's strategies should not be solely developed in response to China. Rather, it should outline Europe's own longer-term aspirations in the digital realm and involve a broader range of actors. In its own words, the EU "defends the vision of a single, open, neutral, free and unfragmented internet, supporting permissionless innovation, privacy and

users' empowerment, as well as the protection of all fundamental rights online or offline"[57]. Standards are important in this regard, but they are only one part of a much broader set of challenges, including data security, disinformation, fostering sustained innovation and bridging the digital divide. European governments already dispose of many tools to ensure the continued healthy functioning of the standards-setting system, and are able to build required new ones at relatively low cost. What is required to do so, however, is political will, decisiveness and pragmatism.

[57] "Answer Given by Mr. Breton" *European Commission* (2020) https://www.europarl.europa.eu/doceo/document/E-9-2020-002042-ASW_EN.pdf

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Dr Rogier Creemers is an assistant professor at Leiden University's China Studies department. His main focus of research is the development of Chinese policy in the digital sphere, both domestically and at the global level.

Julia Voo is a Cyber Fellow and leads the team behind Belfer's National Cyber Power Index. She was formerly the research director for the China Cyber Policy Initiative. Her areas of research concern Geotech strategy including the Digital Silk Road, industrial policy and technical standards for strategic technologies

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