

## Chapter 3

### **Innovative Chinese Firms: A Case Study of Huawei's Corporate Strategies and the Impact of US–China High-Tech War\***

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**Abstract:** The main purpose of this paper is to examine both the strong point and challenge of corporate strategies employed in innovative Chinese firms in the information and communication technology industry through the case study of Huawei. This paper illustrates following Huawei's three corporate strategies as a strong point: (i) innovation and intellectual property strategy; (ii) overseas expansion strategy; and (iii) organisation strategy. We also review the high-tech war between the US and China and consider the challenge faced by Huawei's corporate strategy as a result of the negative impact of sanctions imposed by the US. The paper concludes that the Chinese model of innovation as represented by Huawei will need to be rethought in the light of the imposed restrictions.

**Key Words:** Huawei, R&D, open innovation, standardisation, patent, inclusive business, employee shareholder scheme, US–China high-tech war

#### **1. Introduction**

China has produced numerous large global firms that attach great importance to growing technology and innovation since becoming a member of the World Trade Organization in 2001.<sup>1</sup> One symbolic company in particular is Huawei Technologies (hereinafter

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\* This paper has been extensively revised with the latest trends and analyses added, based on author's monograph on Huawei. See Ambashi (2017) for more details.

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<sup>1</sup> A so-called unicorn company is defined as a technology company that satisfies the following conditions: (i) valued at USD1 billion or more, (ii) unlisted, and (iii) less than 10 years old. According to CB Insight (US) data, as of January 2020, there were 205 unicorns in the US, 101 unicorns in China, and 3 unicorns in Japan. Huawei is not included in these data because it was founded more than 10 years ago. For further details, see

“Huawei”), which has achieved rapid business growth in the information and communication technology (ICT) industry in recent years. Huawei has globally set up research and development (R&D) and sales bases in numerous countries and regions, including the United States (US), Europe, and Asia in addition to its home base in Shenzhen, China. The company is currently one of the best-known Chinese firms with a track record as a cutting-edge global firm.

The main purpose of this paper is to examine both the strong point and challenge of the corporate strategies employed in innovative Chinese firms in the ICT industry through the case study of Huawei.

The reason why this paper takes Huawei as a significant example is twofold. Firstly, Chinese innovation ecosystem of the ICT industry particularly in Shenzhen has been established centring on large firms such as Huawei. As Kajitani (2018) points out, the Chinese innovation ecosystem consists of a multi-layered system encompassing small and medium-sized firms (SMEs) as well as large corporations.<sup>2</sup> Since Huawei stands at the top of the innovation ecosystem of the ICT industry and stimulates other local firms including SMEs towards promoting their business, it is essential to analyse the development of Huawei in order to understand innovation originating from China.

The second reason is that while Huawei is a global innovative firm which represents China as a “high-tech” nation, it has unique characteristics in terms of its corporate strategies that differentiate it from other Chinese firms such as state-owned enterprises (SOE). In comparison with other ICT firms, for example, ZTE, which is also a global and SOE firm with a similar business structure,<sup>3</sup> Huawei has made various efforts to create its own growth model in the form of its corporate strategies as a private company. Furthermore, to correctly understand the background of the present trade war

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<https://www.cbinsights.com/research-unicorn-companies> (accessed on 4 February 2020).

<sup>2</sup> According to Kajitani (2018), there are three categories of companies that support China’s innovation ecosystem: the modern class (companies such as Huawei that aim to establish proprietary technology using modern intellectual property), the pre-modern class (companies that ignore intellectual property rights and produce copy products), and the post-modern class (companies that develop proprietary technology, but actively make it openly available without closing it in a patent). Moreover, Kajitani (2018) argues that these companies function complementarily in the fields of manufacturing and telecommunications through the standardisation and modularisation of design and parts, and that as a result an innovation ecosystem has naturally formed in Shenzhen.

<sup>3</sup> Huawei and ZTE are the representative ICT firms in China based in Shenzhen. While ZTE is an SOE, Huawei is a private company and has a tenfold larger amount of annual sales than ZTE.

between the US and China that has triggered the exclusion of Huawei products by several countries in the West, it is extremely important to examine the characteristics of Huawei's corporate strategies.

This paper analyses Huawei from various angles based on the economics and management literature in an attempt to ascertain the characteristics of innovative firms in China. Section 2 briefly provides an overview of Huawei's development history. In Section 3, this paper illustrates Huawei's three corporate strategies as a strong point that characterise its rapid development to date: (i) innovation and intellectual property strategy; (ii) overseas expansion strategy; and (iii) organisation strategy, are examined. In Section 4, the paper reviews the high-tech war between the US and China that was triggered by the US–China trade war. Section 4 also makes the point that Huawei's corporate strategies now face the challenge as a result of the negative impact of sanctions imposed by the US. Finally, Section 5 concludes the paper.

## **2. Huawei's Development History**

Huawei was established in 1987 in Shenzhen, China by Ren Zhengfei and several others. In retrospect, the company started by reselling switches made by a Hong Kong company; it began manufacturing its own switches in 1990, and then developed an independent digital telephone switch in 1993.

Now it is a world-leading provider of ICT solutions and a comprehensive range of telecommunications equipment, devices, and other related services.<sup>4</sup> It comprises the following three main businesses: (i) networks for communications businesses (installation of communications base stations, relay stations, etc.); (ii) ICT solutions for corporations (servers, cloud data centres, etc.); and (iii) devices for consumers (smartphones, tablets, etc.). Although Huawei entered the business of (iii) consumer devices at a later date, the firm has become well known in recent times for manufacturing low-priced smartphones. Table 1 below provides a brief history of the development of

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<sup>4</sup> While competitors such as Ericsson and Alcatel–Lucent are strong in the mobile communications and fixed-line fields, respectively, Huawei is characterised by having developed its business across both of these fields (Ministry of Internal Affairs and Communications of Japan, 2014).

Huawei.

**Table 1: Development History of Huawei**

1987	Huawei was established by Ren Zhengfei and several others with RMB21,000 (USD3,500) in registered capital. It resold switches manufactured by the Hong Kong-based Hong Nian Company.
1990	Started manufacturing its own switches.
1993	Manufactured C&C08 digital telephone switches (deployed in rural areas initially).
1997	Started cooperating with global consulting firms such as IBM, HayGroup, and Fraunhofer-Gesellschaft to achieve sustainable growth and build a foundation for expanding globally.
1999	Established its first international R&D centre in Bangalore, India.
2000	Began entering overseas markets in earnest.
2001	Established a US corporation.
2005	Became a preferred supplier for British Telecom and Vodafone. Sales from overseas markets overtook sales within China for the first time. Established a Japanese corporation.
2010	Converted from a “communication technology company” to an “information and communications technology company”. Started up three business units: (i) network business for communications businesses, (ii) ICT solutions business for corporations, and (iii) devices business for consumers.
2011	Entered the smartphone business in earnest and shipped approximately 20 million units.
2015	Shipped 100 million smartphones.
2018	Shipped 200 million smartphones, overtaking Apple to become second in the world.
2019	The US Department of Commerce places Huawei on a trade blacklist.

Source: Ambashi (2017) complemented by materials from Huawei and Weekly Economist (2019).

As of 2019, Huawei supplied products and services to 170 countries, and supported the communication environment of one-third of the world’s population.<sup>5</sup> Huawei posted sales of RMB721.2 billion (net profit of RMB59.3 billion) in fiscal year (FY) 2018, with a 52% share of sales in China, and a 48% share of total sales outside

<sup>5</sup> These data are from material made publicly available by Huawei Japan, and later descriptions are also based on this material. See [https://www-file.huawei.com/-/media/corporate/local-site/jp/pdf/hwjp\\_corporatebrochure2019\\_rev\\_web.pdf?la=ja](https://www-file.huawei.com/-/media/corporate/local-site/jp/pdf/hwjp_corporatebrochure2019_rev_web.pdf?la=ja) (accessed on 4 February 2020).

China, a figure almost rivalling its domestic share. However, the fact that its shares were 45% within China and 55% outside China in FY2017 indicates that the trade war between the US and China is gradually having a negative impact on overseas sales, which are centred on North America. In addition, Huawei employs 188,000 employees worldwide, with 80,000 (more than 45%) of those employees engaged in R&D. Furthermore, the majority of employees (approximately 71%) are locally employed at overseas sites, leading Huawei to be recognised as a global firm.

### **3. Huawei's Corporate Strategies**

Its rapid growth of Huawei in recent years has attracted the attention of the world, and several studies have presented a fuller picture of Huawei. This paper empirically observes Huawei's three key corporate strategies: (i) innovation and intellectual property strategy, (ii) overseas expansion strategy, and (iii) organisation strategy. By focusing on these strategies from (i) to (iii), we can obtain useful insights into the characteristics of Huawei as a global innovative firm in China.

#### **3.1. Innovation and intellectual property strategy**

##### **3.1.1. R&D**

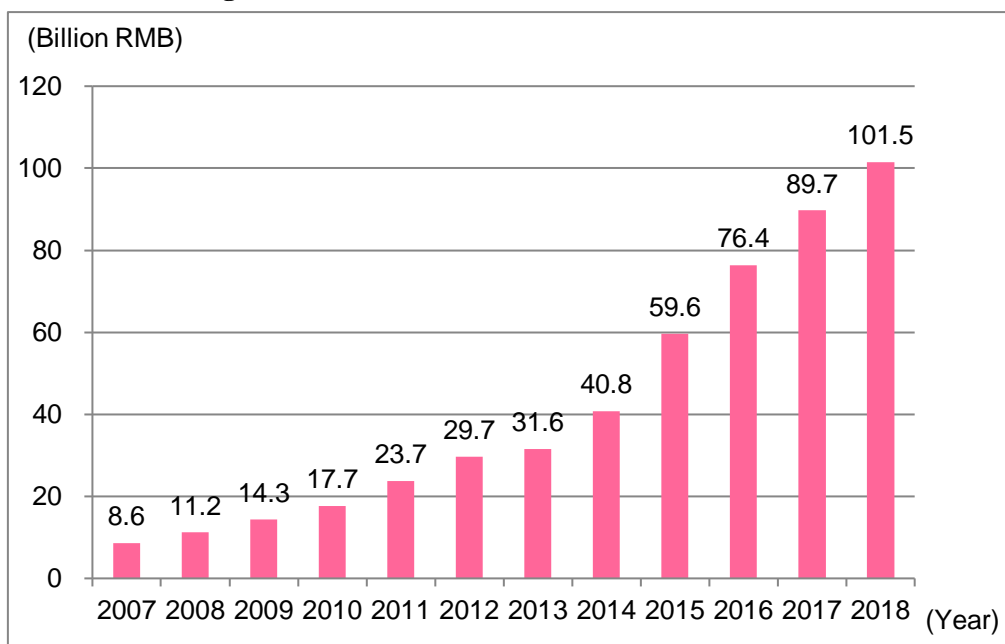
Huawei has placed much stress on innovation to supply cheap products quickly to the market and correctly match demand of its customers. Thus, the firm is most clearly characterised by its strong desire to invest in R&D. In FY2018, Huawei invested RMB101.5 billion in R&D, equivalent to 14.1% of its annual sales. This represents a 13.2% increase in one year, from RMB89.7 billion in FY2017,<sup>6</sup> and a tenfold increase in the last 10 years, from RMB11.2 billion in FY2008 (Figure 1). In addition, Huawei has more or less consistently invested at least 10% of its sales revenue in R&D activities, and has stated that 10% of the amount invested is put towards the development of more

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<sup>6</sup> According to the "Basic Survey Report on Company Activities in 2018" by the Ministry of Economy, Trade and Industry, the overall ratio of R&D spending to sales by Japanese total manufacturing industries and the information and communications equipment industry was 5% and 3% in FY2017, respectively.

innovative technology (Huang, Jaisingh, Kim, and Xu, 2016). As a result, Huawei now has approximately 80,000 employees (more than 45% of the total number of employees) engaged in R&D activities, as well as 15 R&D centres, 36 joint innovation centres, 13 open labs, and 45 training centres worldwide.

**Figure 1: Trend of Huawei's Investment in R&D**



Source: Ambashi (2017) complemented by material made publicly available by Huawei Japan.

Another point worth mentioning is Huawei's attitude towards R&D. According to my interview at the headquarters of Huawei, it does not allow a single person to take full responsibility for the outcomes of R&D research investments, regardless of whether they are a success or a failure. In 2009, Huawei established an R&D lab known as the "2012 Lab," which aimed to achieve a so-called "extra-large home run." In this lab, the R&D team aimed to realise great ideas for the future from ideas that were originally thought to be silly. There is a culture inside Huawei that "R&D leaders who fail must be seen as heroes. That is because they uncovered something that was not working well." However, this kind of company culture that is tolerant of failure was not built in a day. The culture was able to penetrate the company over time due to the management philosophy of "respecting the needs of customers."<sup>7</sup>

<sup>7</sup> Tian and Wu (2014) used a wealth of case studies to successfully illustrate Huawei's efforts to

### 3.1.2. Open innovation

It is clear that simply investing large sums in R&D is not necessarily sufficient to realise innovation that is easily available to customers. Hence, Huawei has employed an “open innovation system”, which it has used to aggressively take in technology and knowledge. According to the latest assessment by Chesbrough and Bogers (2014), who were the first to raise this concept, open innovation is defined as “a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization’s business model.”<sup>8</sup> In other words, a firm in an open innovation system objectively understanding its own innovation capabilities and boundaries can increase its profits by granting other parties a licence to its technological strengths while strategically complementing its weaknesses through joint research or other activities with other parties.

Huawei lacked the innovation capabilities to develop all of its technologies when it started out. Like most Chinese companies (and Japanese and Korean companies in the past), Huawei prioritised prompt product supply, and therefore, imitated the technologies of companies in developed countries in the beginning. By adopting and improving imported technologies for which it obtained a licence and by reverse engineering those technologies, the firm gradually built up its innovation capabilities and progressed from incremental innovation to radical innovation.<sup>9</sup> Huawei is attempting to spur innovation by collaborating with a wide range of industries under the slogan “Achieving a win-win through collaboration,” which coincides with the aim of achieving customer satisfaction.<sup>10</sup>

Moreover, it should be noted that Huawei has open innovation collaborations with universities all over the world. Under the Huawei Innovation Research Program

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encourage the taking on of the challenge of innovation.

<sup>8</sup> See Chesbrough (2003) for an early concept of open innovation. West, Salter, Vanhaverbeke, and Chesbrough (2014) describes concept’s formation process and the latest research trends.

<sup>9</sup> According to Wang and Mitkova (2016), Huawei built a knowledge-sharing system for the organisation in order to achieve open innovation.

<sup>10</sup> For example, Huawei collaborated with the German camera manufacturer Leica in 2016 to establish an R&D centre (the Max Berek Innovation Lab). Additionally, Huawei is promoting joint development in open labs with partners in various industries around the world, including in Munich, Paris, and Dubai. Huawei has more than 400 partner companies, including blue-chip Japanese companies such as Kyocera and Panasonic.

(which was launched in 2010), Huawei collaborates with more than 1,000 of the top universities around the world, including the University of California. Generally speaking, although scientific research in universities is a potential source of valuable technologies, it is often hard to make university researchers aware of the practical needs of industry and profitability (Jensen, Thursby, and Thursby, 2010). In response to this concern, the Huawei Innovation Research Program has systematically overcome the difficulties of generating innovation with universities by creating opportunities for frequent meetings with university researchers and actively promoting awareness of the need for reform on the university side (Huang, Jaisingh, Kim, and Yu, 2016). This can be seen, for example, in Huawei's technology collaboration with the Hong Kong University of Science and Technology, where the company dispatched its own researchers to the university to timely follow up the progress of research.

### **3.1.3. Standardisation and patents**

Huawei's efforts for innovation creation has been directed towards standardisation and patents to strengthen its innovative achievements in the global market. Specifically, its struggle with standardisation and patents began in the mid-1990s, when the company took notice of the future potential of mobile communications and started manufacturing and selling network equipment such as Code Division Multiple Access that was becoming the global standard at the time. In relation to innovation, the success of its standardisation and patents has certainly contributed to Huawei's solid growth.

The establishment of intellectual property through patents has played an especially large role in Huawei's standardisation efforts. As of 2018, Huawei had filed an impressive total of 87,805 international patents, making it one of the most prolific companies in the world (it came second in 2015 with 3,692 applications, first in 2017 with 4,024 applications, and first again in 2018 with 5,405 applications). Huawei's purpose for doing so is to gain an advantage of its innovations over the market competition by quickly obtaining intellectual property rights, while at the same time gaining positive feedback from the market by providing complementary services. The statement "What ensures sustainability of innovation is a legal system concerned with intellectual property rights in particular, and that is lacking in China" does not seem to apply to high-tech Chinese firms such as Huawei, at least. Huawei is developing



proprietary technology and paving a shortcut to intellectual property by protecting such technology with patents (Kajitani, 2018).

In addition, Huawei not only is a member of more than 400 standardisation groups related to various technologies, but also has submitted close to 60,000 standardisation proposals in total.<sup>11</sup> With respect to the standardisation activities expanding around the world, Huawei is aiming to enlarge its share in both developed and emerging markets while taking initiative in the early stages of spreading technologies by increasing the rate of managerial appointments (Ministry of Internal Affairs and Communications, 2014). Notably enough, this demonstrates that standardisation and patents form a basis for Huawei's management in terms of maximally utilising its own innovations in the market.

In this connection, we can point out that Huawei began activities in the fifth-generation mobile communication system technology (5G) in 2009. 5G is a next-generation technology that is expected to replace fourth-generation (4G) technology such as the currently mainstream LTE-Advanced, and is attracting the most attention, particularly in the mobile phone industry.<sup>12</sup> According to Huawei, the firm has more than 500 specialists working on the standardisation of 5G, and is collaborating closely with industry groups and affiliates on expanding activities towards the standardisation of the main 5G-related technologies. More specifically, Huawei is playing a leading role in "5G Infrastructure Public Private Partnership" (5G-PPP), a joint initiative between the European Commission and European ICT industry, whereby Huawei has announced a joint declaration with major telecommunications carriers and vendors around the world to promote a unified 5G standard. In February 2017, Huawei agreed on a joint proposal with major companies around the world concerning the formulation of a 5G standard specification at an early stage with the aim of developing 5G commercially in 2019. In

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<sup>11</sup> Huawei is said to have contributed more than 70% of the proposed solutions regarding the standardisation of a high-frequency band (6G to 100GHz) transmission model for 5G in the "3rd generation partnership project" (3GPP) undertaken by a mobile communications standardisation group (Nikkei Technology, 2016).

<sup>12</sup> According to NTT Docomo, the conditions for 5G are (i) high capacity (1,000 times larger than LTE); (ii) high-speed communication (up to 10 Gbps or more); (iii) low latency and high reliability (latency of 1ms or less for wireless access); (iv) very high number of concurrent users (100 times the current number of concurrently connected devices); and (v) low-cost and low-energy usage. See the following URL in Japanese.

<https://www.nttdocomo.co.jp/corporate/technology/rd/tech/5g/5g01/02/02.html> (accessed on 4 February 2020).

this way, Huawei is collaborating with various industry partners (in Japan it has implemented joint testing with NTT Docomo and SoftBank), and leading the formulation of standardisation in high-frequency band networks, architectural design, and so on.

### **3.2. Overseas expansion strategy**

The overseas expansion strategy as described below enables Huawei to deliver cheap and quick products to the market. Huawei expanded its share in newly emerging markets where the level of technology is comparatively low, put its efforts into growing that share, and later expanded its business in various European countries, the US, and Japan based on its experience in newly emerging markets. In other words, Huawei can maintain its current scale of management and expand globally due to its success in newly emerging markets. As a result, as of the end of 2019, it operates in 170 countries and is succeeding in creating R&D and product planning based on local needs.

Inclusive business, which comprehensively incorporates the so-called Base of Pyramid (namely, poorest group of people),<sup>13</sup> is the key to evaluate the overseas expansion strategy. Under the inclusive business model, business solutions are expected to contribute to solving societal issues such as poverty. Yet, since businesses are not simply philanthropic ventures, but are expected to expand in scale and generate profit in the long term, this demands management techniques that differ from those of existing businesses expanding in developed countries. In this respect, ICT businesses have attracted attention for their potential as supporters of inclusive business. For example, smartphones are rapidly spreading among the general public even in newly emerging countries, and ride services such as Grab and GO-JEK make use of them in Southeast Asia. Furthermore, the spread of mobile phones has enabled the use of mobile remittance and settlement services in African countries.

Ikuta, Oya, and Kato (2015) reference Huawei's initiative in Bangladesh as an example of its inclusive business in ICT firms. In Bangladesh, which is a typical developing country, mobile phones are spreading at a rapid rate, with a high volume of

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<sup>13</sup> According to the International Finance Corporation (2014), the Base of Pyramid segment (defined as those earning less than USD3,000 per year) is estimated to contain more than 4.5 billion people with a combined purchasing power of USD5 trillion, 52% of the total consumer spending in both developed and developing countries.

capital investment expected to continue for 3G and 4G lines. This is thus an attractive large market for Huawei. When expanding to local markets, Huawei collaborates closely with local major communications carriers by employing the inclusive business model. For example, Huawei participated in the Phone Lady Project, a service for lending mobile phones to women in rural areas to provide women on low incomes with opportunities to earn cash. Huawei also participated in the solar-powered base station installation project (involving the installation of 4G base stations that operate independently using solar or diesel power) implemented by Grameenphone, and has since entered the market as an important Grameenphone customer.

In sum, Huawei is treating inclusive business as an important opportunity to expand its business and sell its products globally.

### **3.3. Organisational strategy**

Huawei is also making creative efforts within its own organisational structure to enhance its business activities. That is, the organisational strategy of Huawei can be viewed as an important complement to effectively implement the other two strategies.

To this end, Huawei adopts an employee shareholding scheme with the company wholly owned by its employees, where more than 80,000 employees are shareholders through the employee union (on the other hand, the stake held by founder and CEO, Ren Zhengfei, is no more than 1%). Remarkably, this scheme is used primarily as a significant impetus to motivate concentrated investment in R&D and innovation. In fact, Huawei itself generalises that its employee shareholder scheme effectively matches the goals of individuals with the company's long-term development based on R&D and innovation without pursuing short-term profit.<sup>14</sup>

Huawei also has some other interesting organisational strategies. For example, in my visit to the Huawei headquarters I learned that Huawei regularly replaces its executives, other than the CEO. Although this kind of measure is clearly not efficient from the perspective of business continuity, such organisational reform is rooted in

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<sup>14</sup> Huawei considers Motorola a bad example in that, despite its dominant position in mobile phone technology in the past, Motorola aimed for short-term profits as a publicly traded firm and reduced its R&D investment in 3G technology. Huawei evaluates that Motorola gradually lost its market dominance as a result because it was a public-listed firm.

concerns about the company as a whole getting stuck in a rut. Huawei is fully devoting itself to generating innovation, the key to growth, by consistently ensuring a fresh environment within the organisation. It can be said that periodical replacement of management executives may provide an opportunity to change collaborative research partners in open innovation after a certain period of time, and thereby, generate different types of innovations.

Moreover, Huawei is doing everything it can to foster a sense of loyalty among its employees and provide greater incentives for innovation. Huawei's sprawling headquarters (known as the "campus") in Shenzhen, covering an area of approximately 2 million square meters, is fully equipped with facilities to support employees' welfare (e.g. employee dormitories, cafeterias, a hospital, gymnasium, tennis courts, and so on). Surprisingly, my visit revealed that Saturday is also a working day at Huawei headquarters, and the company is trying to attract excellent talent who can withstand hard work by offering high wages and a high level of welfare, which are made possible by the company's rapid rate of growth.

#### **4. Impact of the US–China High-Tech War**

Donald Trump won the 2016 US presidential election as the Republican candidate on the slogan "Make America great again," and was inaugurated as the 45th President of the US on 20 January 2017. President Trump promoted protectionist trade policies and, in March 2018, imposed additional tariffs on steel and aluminium from countries such as China and Japan. China retaliated with additional tariffs on imports from the US triggering a US–China trade war. During 2018 the Trump administration imposed three stages of sanctions and tariffs (worth the equivalent of USD250 billion) on Chinese goods with the aim of reducing China's trade surplus with the US, and this exchange of retaliatory tariffs was continued on the Chinese side. In October 2019, the US imposed a fourth round of additional tariffs. Table 2 below summarises the main sanctions imposed on China by the US as of February 2020.

**Table 2: Main Sanctions Imposed on China by the US (as of February 2020)**

July 2018	First round of tariffs on China (industrial machinery, etc. worth the equivalent of USD36 billion)
August 2018	Second round of tariffs on China (plastic goods, integrated circuits, etc. worth the equivalent of USD16 billion)
August 2018	The US implemented the National Defence Authorization Act, which prevents US government agencies from procuring products from companies such as Huawei.
September 2018	Third round of tariffs on China (foodstuffs, furniture, etc. worth the equivalent of USD200 billion)
January 2019	The US Department of Justice prosecuted Huawei and Ren Zhengfei's daughter regarding illegal trade with Iran
May 2019	The US Department of Commerce adds Huawei to the Entity List.
November 2019	The US Federal Communications Commission bans subsidised communications carriers from procuring Huawei products. The US Department of Commerce announced its continuation of trade embargo with Huawei
February 2020	The US Department of Justice prosecuted Huawei and Ren Zhengfei's daughter regarding concealment of trade with North Korea

*Source:* Created by the author based on various media reports.

In keeping with the trajectory of the US–China trade war, the US Department of Commerce imposed regulations that effectively banned the Chinese high-tech companies Huawei and ZTE from trading with US companies for security reasons.<sup>15</sup> The Entity List, which effectively bans export to US companies, contains many manufacturing and ICT firms, including Huawei. The reason for the ban was security concerns that Huawei's ICT equipment may be connected to critical information leakage.<sup>16</sup> Huawei and the affiliated companies that are its R&D bases have been also included in the Entity List in order to weaken R&D activities that are Huawei's strength. Consequently, the US has essentially declared that it will not import Huawei equipment for 5G, the next-generation

<sup>15</sup> In addition to the sanction placed by the US Department of Commerce, the 2019 National Defence Authorization Act introduced measures to exclude five companies in addition to Huawei and ZTE from procurement by the US government, beginning in August 2019. Plus, the US Federal Communications Commission introduced measures to ban subsidised communications carriers from procuring from Huawei.

<sup>16</sup> Authors have different views about whether Huawei conducts acts of stealing information through its devices. Marukawa (2019) insists that information leakage can generally happen in all 5G-related products of not only Huawei but also other ICT firms.

communication standard, and there is a growing movement to exclude Huawei from Japanese companies as well. Regarding smartphones that have been a mainstay of the company's profits in recent years, it is expected that the main software (email, maps, and so on) provided by the US firm Google will no longer be usable on any Huawei devices sold overseas, which will be a major pain point for selling smartphones in overseas markets.

The exclusion of Huawei in this manner by the US seems to be intended as a strong warning to China, which has advocated its own "Chinese Manufacturing 2025"<sup>17</sup> industrial policies. It is concerned that China has actively invested in advanced science and technology fields (including through providing public subsidies), and has rapidly boosted its technological capabilities. In the intensifying battle between the US and China surrounding the so-called technological hegemony, Huawei has come under strong pressure from the US due to its status as a symbol of high-tech Chinese firms. Under the influence of US pressure, there is also an increasing trend for standardisation groups and relevant academic societies related to ICT standards to cancel Huawei's membership temporarily.

The US–China "high-tech war" is expected to continue for the foreseeable future. In November 2019, the US Trade Representative stated that the partial agreement in trade negotiations did not include the ban put in place with respect to Huawei. Thus, the impact of the various regulations applied by the US to Huawei will likely increase in the future and cannot be ignored. ZTE, which operates in the same industry as Huawei, has been temporarily prevented from supplying semiconductors to the US, and has fallen into management difficulties. Although there is no sign that Huawei is in danger of bankruptcy for now, Huawei management forecasts a USD30 billion fall in income in its planned expenses for the two-year period from 2019 to 2020. Founder and CEO Ren Zhengfei also attracted attention after sending an email to all employees about the company being "in danger of dying" due to the sanctions and regulations by the US government.<sup>18</sup>

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<sup>17</sup> Chinese Manufacturing 2015 (announced in May 2015) covered 23 items and 10 important fields, including next-generation information technology (e.g. semiconductors and the 5G communication standard), aviation and space equipment, and energy-saving and new-energy vehicles, with the aim of advancing the Chinese manufacturing industry. Chinese Manufacturing 2025 is recognised as the basis of a long-term strategy to join the world's leading manufacturing powers.

<sup>18</sup> It is pointed out that Huawei's sense of crisis stem from its weak technological structures. An analysis of the 5G-related patents filed around the world pertaining to three fields—(i)

In response to the crisis facing Huawei and ZTE, the Chinese government has set a goal of building self-sufficiency by increasing the share of semiconductors produced domestically from 10%–20% to 70% in the near future, with the aim of freeing Chinese companies from dependence on the US for semiconductors. Thus, Huawei is strengthening its semiconductor development and mass production systems to ensure the stable procurement of semiconductors, a core product for Huawei, in anticipation of a prolonged US–China trade dispute. Moreover, with respect to smartphones, Huawei is urgently developing its own apps that will not be dependent on Google. But it will likely take considerable time for Huawei to set up its own supply system for parts and apps.

To sum it up, the exclusion of Huawei from the global market and stakeholder groups could restrict the potential of its business development that has been led by the key corporate strategies, especially (i) innovation and intellectual property strategy and (ii) overseas expansion strategy. In addition, (iii) organisational strategy might be heavily affected by downturn of employees through the stagnation of business activities.

## 6. Concluding Remarks

In this paper, we analysed Huawei’s unique corporate strategies that characterise Chinese innovative firms in the ICT industry. We stressed that the three key corporate strategies are an essential strong point behind Huawei’s rapid development. Until the outbreak of the US–China dispute, they worked well with a great momentum of growth. However, a high-tech war broke out between the US and China at a time when its performance was favourable. Since the US positioned China as a threat in terms of competition and for security reasons, Huawei was imposed various restrictions on its business activities. Currently, the serious challenge arises as to whether Huawei’s business model involving the corporate strategies can be sustained in the future. Huawei’s value is being called into question as it has not experienced the restructuring that accompanies business shrinkage

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communications devices and base stations for 5G, (ii) semiconductors for devices such as central processing units, and (iii) basic software—reveals that, while Huawei has acquired a comparatively large number of the standard-essential patents for which it applied in these three fields, part of its core technology is heavily dependent on US and European companies (Nikkei Shinbun, 2019).

or pain. If the high-tech war continues for many years to come, the Chinese innovation model as represented by Huawei will face a need for reorganisation to accommodate to the imposed restrictions.

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