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THE U.S. SANCTION ON HUAWEI

Geopolitics as a determining factor in business strategy

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Abstract

The foreign policy of large states has a huge impact, in an interdependent world, on global companies in all sectors. In this paper we will analyze, through the case of Huawei, how the trade war between the two largest world powers (and their allies) affects the technology sector and how this Chinese company has adapted its business strategy to the new environment that is presented to it. To examine these effects, the work is divided into two main blocks: first, the conflict and the corporation are contextualized, while in the second part, Huawei's strategy of two business units - electronic equipments and telecommunications (5G) - is analyzed before and after the geopolitical obstruction. In conclusion, this research should allow us to understand how a large company can deal with a critical external situation as this one and pivot its international business to avoid a hit that, for many other companies, would have been fatal.

Key words: *Huawei, China, U.S., trade war, business strategy, competitive strategy, corporate strategy*

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1. INTRODUCTION

1.1. A ghost travels the world: globalisation[1]

The main consequence of this phenomenon is the creation of a "global village", without borders, without limits, without residence, where individuals, goods and capital circulate freely[2].

This gradual opening up of countries to the outside world and the establishment of an interconnected world where it is increasingly difficult to live in isolation has led to the rise of international relations as key and determining tools for understanding the internal evolution of states. In other words, it is impossible to analyse a country's national economy independently without taking into account its network of contacts with other states.

The growing dependence between countries causes frictions that directly affect the economy and businesses. It is no secret that geopolitics or diplomatic relations between countries can benefit or harm companies, and these (uncontrollable) factors must always be taken into account by companies when making decisions.

In recent years, the most prominent international conflict has been that between the United States and China in what we can classify as a battle for world hegemony. But unlike other periods, today's "wars" appear to be waged with another type of weapon, namely companies. Especially in the liberal democracies, there has been a gradual withdrawal of the state from the economic sphere in favour of the market, which has gradually deprived the public authorities of the possibility of mobilising national resources as they see fit to deal with potential adversaries[3]. In fact, we have observed this new chessboard in the chino-American conflict, where multinationals have become the pawns of this grand-scale, intricate game..

In this context, on May 15th 2019 the confrontation shifted from the commercial to the technological and geopolitical arena, when Huawei was blacklisted by the Department of Commerce in an attempt by the American bureaucracy to prevent, for the first time in modern history, a Chinese company from taking the lead in state-of-the-art technology (5G). Thus began what some experts have termed the technological Cold War, which is characterised by a "militarisation of interdependence, a way of weakening the adversary through the links of economic interdependence woven between two countries". The restrictions imposed forced the Chinese company to completely overhaul its supply chain and hence its strategic plan. Thus,

[1] Bodemer, K. (1998).
[2] Chávez, A. C., Reyes, R. & Pérez, P. S. (2006).
[3] Thibout, C. (2020).

the United States used its excessive powers over global technology value chains[4], to dynamite Huawei's logistic and operational structure seeking to strike a definitive blow against one of the world's leading companies.

The most globalised sectors of the economy risk being held hostage to bilateral tensions between countries, with the consequent risk of destabilising the companies that are part of it. Companies competing under these global conditions must therefore be prepared to face the instabilities that are characteristic of international relations.

1.2. Objective and methodology

Precisely, the Huawei case is paradigmatic of this question, as it was involved in a conflict of great magnitude that could easily have led to its disappearance as a company or, at least, a significant drop in its results. How have they managed to get out of this situation? In this paper we will analyse the company to see how it has developed this process of strategic metamorphosis with the aim of reducing the impact this blockage can have on its business.

One of the main limitations that we found when developing the study is that the conflict is still alive and therefore it is difficult to know the real extent of the effectiveness of the strategic changes implemented by Huawei. However, we do know what these changes have been and how Huawei is trying to implement them.

In order to carry out the analysis, the work is divided into two large blocks: firstly, it is necessary to provide a brief explanation of Huawei and his characteristics, as well as to summarise the US-China conflict in order to place the reader in the subject matter. Secondly, the strategies carried out by the company before and after the conflict will be analysed, in order to see more clearly the pivoting carried out. This study focuses only on Huawei's two main business lines, mobile telephony and telecommunications (with special emphasis on 5G).

[4] Nocetti, J. (2020).

2. CONTEXTUALIZATION

2.1. HUAWEI

2.1.1. History

Huawei Technologies Co., Ltd. (hereinafter Huawei), is a multinational company founded in China in 1987 by military engineer Ren Zhengfei, who initially had a total of three employees and a share capital of ¥21,000 (about 3,000 euros) from private sources[5]. It was founded in the city of Shenzen, considered today as the "Silicon Valley" of China[6], so that its development as a company has been closely related to the technological progress that the mentioned city has experienced in parallel. The company started its economic activity by reselling IP PBX Systems (Private Branch Exchange) imported from Hong Kong, while they started to develop their own by means of reverse engineering[7]. Huawei grew exponentially, investing in R&D and developing high quality technology. Between 1990 and 1993, it began selling its own products and then began a process of internationalisation in 1999[8].

Huawei, currently present in 170 countries, defines itself as "**a leading global provider of Information and Communication Technology solutions**"[9], leading, from 2012, the list of the world's largest manufacturers of telecommunications equipment[10]. In addition, since 2003, when Huawei created the telephony department, the company has been on a meteoric rise to become the world's largest smartphone manufacturer, overtaking Apple in 2018 and surpassing Korea's Samsung for the first time in 2020[11].

2.1.3. SWOT Analysis

Taking into account the markets where Huawei operates (cf. Annex 1) and its internal structure (cf. Annex 2) we have detected the following Weakness, Threats, Strength and Opportunities for Huawei.

[5] Tao, T., & Chunbo, W. (2015).
[6] Abril, G. (2017).
[7] Reverse engineering: process carried out with the aim of obtaining information or a design from a product, in order to determine what its components are and how they interact with each other and what the manufacturing process was.
[8] Arteaga, S. (2020).
[9] Huawei (2019). Huawei Corporate Information.
[10] China Go Abroad (2012).
[11] Gibbs, S. (2018) and Chitkara, H. (2020).

Weaknesses	Threats
Multiple disputes (industrial property, human rights, espionage). Bad reputation regarding security.	Regulatory pressure and commercial pressure Pressure from competitors Increase in labour costs and raw materials Economic and health crisis End of globalisation
Strengths	**Opportunities**
World leader in telecommunications equipment World leader in the smartphone market World leader in 5G base stations and their commercial deployment Ability to compete on price Great capacity for innovation and abundant resources for investment in R+D. Ability to quickly adapt to the environment International presence	Artificial Intelligence and 5G Growth of the African smartphone market Growth of the middle class

2.2. THE GEOPOLITICAL CONFLICT: U.S. V. CHINA

2.2.1. Overview[12]

On March 22nd 2018, President Donald Trump signed a memorandum in which he committed to (i) lodge a complaint against China with the World Trade Organisation for unfair trade practices, in particular in the field of intellectual property, (ii) restrict investment in key technology sectors, and (iii) impose tariffs on Chinese products (such as aerospace, information and communications technology, and machinery).

From this point onwards, a series of threats and announcements of new tariffs on key sectors and imports were made by both countries (cf. Figure 1)

This behaviour by Trump initiated the so-called trade war between the United States and China, where the two economic powers sought to settle their world hegemony. To this end, both countries launched a series of threats and announcements of new tariffs on key sectors and imports, which can be summarised in the figure below:

Figure 1: Chronology of the US-China trade war

	US	China
JUL 2018	Tariffs worth $34 billion	Tariffs worth $34 billion
AUG 2018	Tariffs worth $16 billion	Tariffs worth $16 billion
SEPT 2018	Tariffs of $200 billion at 10%	Tariffs of $200 billion at 10%

[12] This section is based on the following bibliography: Wong D. & Koty, A. C. (2020); Reuters (2020); Bown, C. P., & Kolb, M. (2020); South China Morning Post (2020).

MAY 2019	Tariffs of $200 billion at 25%	-
JUN 2019	-	Tariffs of $60 billion at 25%
SEPT 2019 DIC 2019	The application of some tariffs is postponed, but there are mutual threats of new tariffs and increases in existing ones.	
DIC 2019 JAN 2020	Phase 1 Trade Agreement	
	Reduction of tariffs on $120 billion of Chinese products imposed in September. Suspension of a tariff on some $162 billion worth of Chinese goods in December.	Suspension of the tariffs on US goods that were due to take effect on 15 December. Additional purchases of $200 billion of American goods and services over the next two years.
FEB 2020 JUL 2020	Tariff exemption on certain types of medical equipment.	Halve additional tariffs on $75 billion in 2019 on U.S. products (cars, pork, chicken, beef, soybeans, chemicals, crude oil...) Lifting of the ban on imports of certain US agricultural products.

Source: Own elaboration

2.2.2. Huawei Case[13]

In May 2019, at the height of the trade war, the United States government signed an executive order placing Huawei, among others, on the Entity List: a list of foreign entities subject to specific licensing requirements for the export, re-export and/or transfer (within the country) of certain items[14]. The Trump administration justified this action by claiming that the Chinese government was conducting espionage practices through the Huawei systems, which could pose a serious danger to the country's national security. For practical purposes, the inclusion on the Entity List at that time resulted in a commercial veto whereby US companies could no longer do business with the Chinese technology and any licences granted to US companies were withdrawn.

Just one week after the executive order was issued, the United States suspended the effects of the trade veto for 90 days[15], following the need for U.S. companies, which were granted a series of temporary licenses from the Department of Commerce, to mitigate the effects of the veto (according to the FCC: $1.8 billion[16]). The latest extension, which could be final, sets May 2021 as the limit for making the executive order effective[17].

[13] This section is based on the following bibliography: Brownlee, M. (2019); TechAltar. (2020); Faulkner, C. (2019); Nieto, J. G. (2019).
[14] Bureau of Industry and Security. U.S. Department of Commerce. (2020).
[15] Millán, J. (2019).
[16] Brandom, R. (2020).
[17] *Ibid*.

3. HUAWEI'S STRATEGIC MOVEMENTS

This block of contents will analyse the corporate and competitive strategy adopted by this company in the electronics and telecommunications equipment sectors, before and after the US political decision, to study whether these have been modified and how the company has adapted to the new scenario.

3.1. ELECTRONIC EQUIPMENT

3.1.1. *Ex-ante* strategy

Huawei has experienced year-on-year growth in the sector (c.f Annex 3.2) to become, before the conflict in 2019, the largest smartphone manufacturer[18] and the second largest in sales worldwide[19]. This growing trend has continued despite the current geopolitical situation, until it positioned itself as the leader in sales, surpassing Samsung in the second quarter of 2020[20].

Creating and maintaining this leadership position in a **highly concentrated market** (c.f. Annex 1.2) implies very good management of resources and capabilities (c.f. Annex 2) at a strategic level by Huawei.

A) Competitive strategy

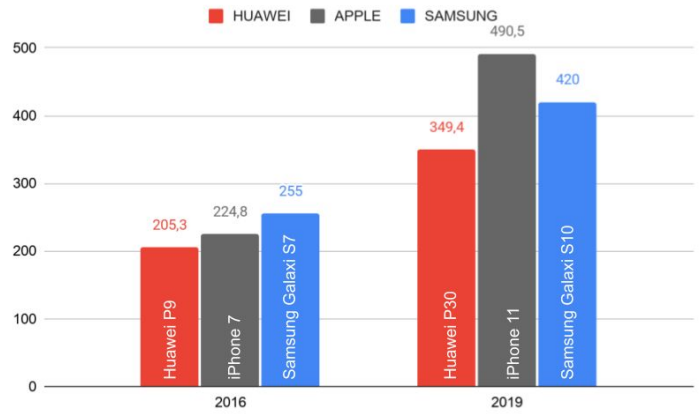
Competitive strategy is a long-term action plan of a company to attain a **competitive advantage** over its rivals. According to Michael Porter[21], and focusing on the industry wide competitive scope, a company can opt to implement a differentiation or cost leadership strategy. Managing both strategies at the same time is very difficult due to the existing trade off (if you want to lower costs you standardize the process and this difficulties differentiation and vice versa). However Huawei has been able to successfully manage a **dual strategy** that has allowed it to gain a sustainable competitive advantage.

Huawei has successfully implemented the **cost leadership strategy** by being the lowest cost mobile phone device producer (cf. Figure 2) thanks to product standardisation and cheap labour in China. This efficient management of the value chain allows it to exploit **economies of**

[18] Gibbs, S. (2018) and Chitkara, H. (2020), *Op. Cit.*
[19] Chau, M. & Reith, R. (2020) and Counterpoint Research. (2020).
[20] Canalys (2020); Chau, M. & Reith, R. (2020), *Op. Cit.*
[21] Michael Porter (1998).

scale. However, Huawei's **competitive advantage** does not come so much from low-cost manufacturing as from **low-cost engineering**. Since the company's inception, it has prioritised research and development[22] which, combined with experience in other fields of technology applicable to smartphones, has enabled it to reduce costs compared to its competitors. In other words, there have been and are **economies of scope**.

Figure 2: Production costs of smartphones for Huawei, Apple and Samsung



Source: Own elaboration from data of Statista[23], Techwalls[24] and El Android Libre[25]

Along with the cost leadership strategy, Huawei also uses the **differentiation strategy**, offering unique features in its products[26]: "*it is the smartphone brand with the best camera in the market; with the first processor with artificial intelligence; with the first camera powered by artificial intelligence; with the longest battery life; with the first certified safe fast-charging technology and technology leaders for 5G networks*"[27].

B) Corporate strategies

The growth strategies adopted by Huawei to achieve the growth experienced include market penetration, product development, market development and diversification.

[22] Rivera, N. (2016).
[23] Canhoto, A. (2017).
[24] Do, T. (2019).
[25] Solís, I. P. (2019).
[26] Iglesias, G. R. (2017).
[27] Peña, C. (2018).

Figure 3: Huawei Ansoff matrix

Source: Own elaboration

3.1.2. The conflict

To make a device, such as a smartphone, tablet or computer, Huawei needs software (e.g. Google) and hardware (e.g. Qualcomm) suppliers located in the United States. By way of example and as shown in table 1, to make the Huawei P30 model, 15 components of American origin are required, representing 16% of the total value of the device[28].

Table 1: Breakdown of parts used in Huawei P30 Pro (estimated cost)

	Total cost: $363.83	Total number of parts: 1,631
U.S.A	$59.36 (16.3%)	15 parts (0.9%)
China	$138. 61 (38.1%)	80 parts (4.9%)
Japan	$83.71 (23.0%)	869 parts (53.2%)
South Korea	$28 (7.7%)	562 parts (34.4%)
Taiwan	$28.85 (7.9%)	83 parts (5.0%)

Source: Nikkei Asian Review[29].

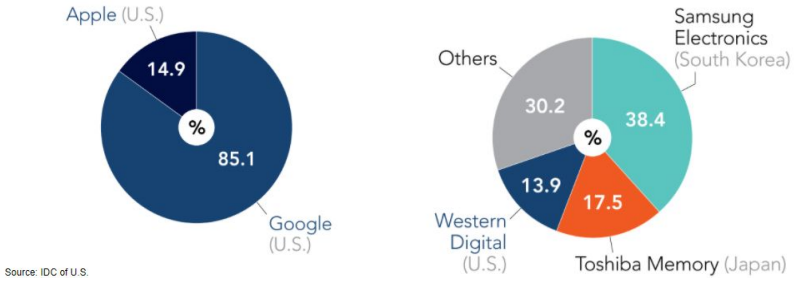
Following the announcement made by the US Government, many companies, including Google, Intel, Qualcomm, Broadcom, Micron Technology and Western Digital[30], decided to stop supplying Huawei. In order to understand the impact of this decision on Huawei, it is interesting to evaluate the market power of the suppliers..

Hardware and software suppliers often offer products of **high specificity, high technical level and quality**[31] necessary for the optimal development of electronic products. These

[28] Sputnik Mundo. (2019).
[29] Nikkei Assian Review. (n.d.).
[30] Muñoz, R. (2019, May 20).
[31] Huawei (n. d.). Supply Chain Responsibilities.

suppliers are usually small and highly specialised due to the technical complexity involved in their production. However, the companies that announced their commercial dissociation with Huawei are large companies in their sector (cf. Figure 4).

Figure 4: Market share of server operating systems & Global market share of NAND flash memory chips .



Source: Nikkei Asian Review[32]

Still, it is important to note that there are alternatives available to replace certain US semiconductor suppliers (cf. Table 2) although the issue is more complicated to replace the operating system supplier (cf. Figure 4).

Table 2: Alternatives to some U.S. semiconductor suppliers

	U.S. suppliers	Alternative suppliers
Memory chips	Micron	SK Hynix (South Korea) Samsung (South Korea)
Storage chipso	Seagate Western Digital	Toshiba (Japan) Samsung (South Korea)
Radio frequency and energy management chips	Qorvo Skyworks Qualcomm	Mediatek (Taiwan) Murata (Japan) HiSilicon (Huawei subsidiary)
Telecommunications infrastructure	Xilinx ADI TI	Huawei capacity increase

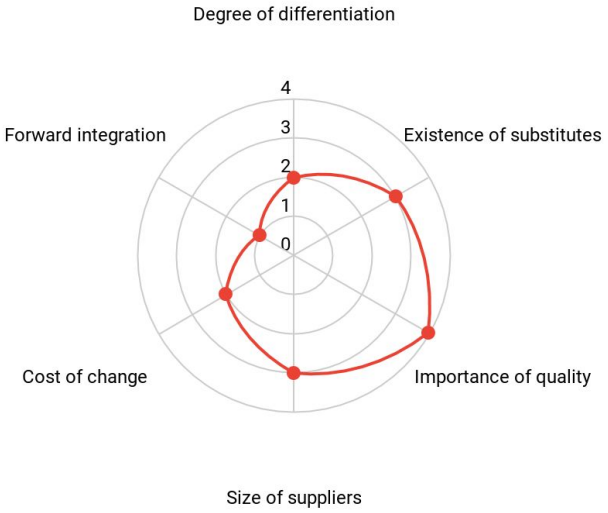
Source: Own preparation based on information from MarketLine[33]

Finally, we will assess as practically non-existent the risk of a possible forward vertical integration by these Huawei suppliers due to the complexity involved in the finished electronics business. On the contrary, as Huawei has done and, as will be seen in the following sections, the companies that develop electronic products have indeed made vertical integration backwards by producing parts of their devices and even developing software.

[32] Nikkei Assian Review. (n.d.), *Op. Cit.*
[33] MarketLine. (2020, June).

After weighting the different variables, it is concluded that the market power of these suppliers is **moderate-high** (cf. Figure 5 where these weights are represented graphically).

Figure 5: Indicators of the market power of Huawei suppliers



Source: Own elaboration

3.1.3. *Ex post* strategy

Following the announcement of the ban on US companies marketing Huawei, Huawei has been able to continue to support its hardware with US software updates thanks to temporary licences from the Department of Commerce. The initial response from supplier companies to stop supplying Huawei (cf. Table 3) forced Huawei to rethink its **corporate strategies of market development but also diversification**. The decision to "make or buy" has been greatly simplified, with nuances as will be seen, choosing to intensify its corporate strategy of **vertical integration** trying to maintain its **dual competitive strategy**.

Table 3: Supplier response to temporary licences granted by the Department of Commerce.

Company	Google	ARM	TSMC	Microsoft	Intel	AMD	Nvidia
Product	Software	Core Architecture	Microprocessors	Software	Processors	Semiconductors	Figure Processing
Country	U.S.	Japan-UK	Taiwan	U.S.	U.S.	U.S.	U.S.
Licensing	NO	Not needed (NO U.S.)	Not needed (no U.S.)	YES	YES	YES	YES
Maintain service	NO	NO Own decision	NO Own decision	YES	NO	YES	YES

Source: Own elaboration through data collected by TechAltar[34].

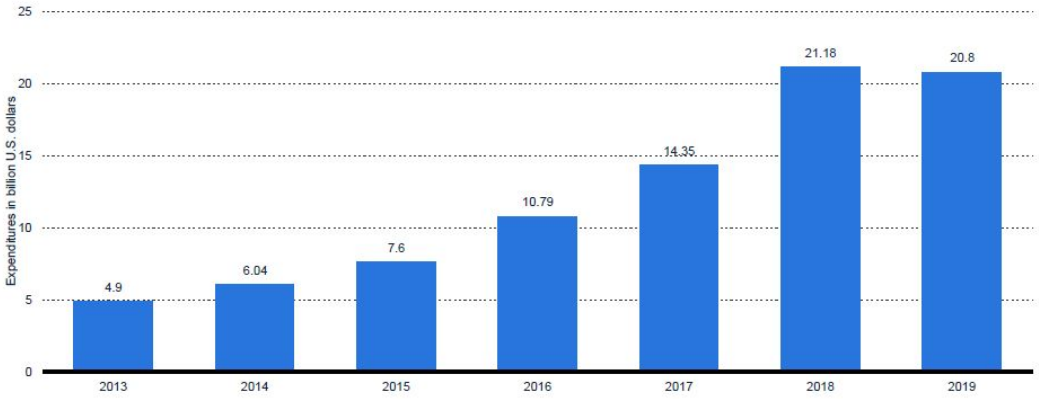
The following sections will analyse how Huawei has reorganised its production chain in the face of the new reality it has had to face.

[34] TechAltar. (2020), *Op. Cit.*

A) Huawei's response to hardware suppliers

The 90-day "reprieve" was extended[35] until May 2021[36] and has allowed Huawei to source components for over a year, while seeking ways to reduce its dependence on US-based components[37]. (cf. Table 2 and Figure 6).

Figure 6: Huawei's spending on semiconductors from 2013 to 2019 (in billions of US dollars).



Source: Statista[38]

Furthermore, it is relevant that the foreign semiconductor industry is highly globalized; as stated in the MarketLine Case Study[39], the largest U.S. semiconductor companies have less than 60% of their physical assets located in the United States. It has therefore not been difficult for Huawei to obtain such products from third countries.

B) Huawei's response to software providers (Google)

All its devices work with the Android operating system, which means that there are limitations on Google applications (Google Mobile Services) such as Gmail, YouTube, Google Maps and even the Google Play Store itself [40], but above all on Google services (Google Play Service), which prevents the software on the devices from being updated without depending on updates from the phone manufacturers[41]. Although Android is open source software, this also affects access to other applications from American companies (Netflix, Instagram, Whatsapp, Snapchat, Uber...).

The alternatives to the use of Android (from Google) as an **operating system (OS)** were quite limited for Huawei: iOS (from Apple), Windows Phone, BlackBerry OS and Symbian OS

[35] Agencia EFE (2019) and Arana, I. (2019).
[36] Gartenberg, C. (2020, May 13).
[37] MarketLine. (2020, June), *Op. Cit.*
[38] Aslop, T. (2020).
[39] MarketLine. (2020, June), *Op. Cit.*
[40] Brown, S. C. (2020).
[41] OCU (2020).

(from NOKIA)[42], the first two companies being also American. However, as can be seen in Figure 4, Android and iOS lead the OS market as the rest operate only on the devices developed by the companies themselves. Thus, the only "cross over" operating system that works on different devices regardless of the smartphone manufacturer is Android.

Faced with this reality of a shortage of suppliers and with regulations that limit transactions, the only viable strategy for Huawei was to make a **backward vertical integration** and start developing its own OS (**HarmonyOS**) and its own application shop (**AppSearch**) so that users of its devices can access Google apps (cf. Annex 4). Huawei has entered into a new business market (Operating systems); and although it is not technologically or business related with the mobile phones market , it must be considered a **related diversification strategy** , as it is in the same value chain. Huawei has done all this action **from scratch (organic growth).**

3.2. TELECOMMUNICATIONS (5G)

Huawei was born as a telecommunications equipment company (broadband access, optical and microwave transport, radio access network and mobile network core, Service Provider Router (SPR) and switches for Carrier Ethernet) and today this market remains one of its main revenue sources as shown by the fact that 50% of its revenues come from the Carrier Networks division[43]. In 2017 Huawei held its position as world leader in the sector[44], bringing together 31% of the revenue generated in the sector by 2020[45].

Huawei has reached this position of market leadership by implementing different **corporate strategies** that have allowed it to grow and internationalise, and which are detailed below.

Figure 7: Timeline of strategic phases in the Carriers unit

1st phase	1987	Focus on the Chinese domestic market, as a PBX vendor and move to produce its own products. Rural areas, low cost and no competitors.
2nd phase	1993 2000	Business growth and structural organisation to prepare its jump to the international market. Initial phase of internationalisation, focusing on developing countries.
3rd phase	2020	Acceleration of internationalisation and focus on internationalisation in developed countries By 2006, 65% of its income came from the international market, compared to 10% in 2000.

Source: Own elaboration from the information extracted from the work "The Globalization Strategy of Chinese Multinational: Huawei in Mexico" [46].

[42] Mira Cómo Se Hace. (2020).
[43] Rivera, N. (2016), *Op. Cit.*
[44] Martín, A. M. (2019).
[45] Gascón, M. (2020).
[46] Micheli, J., & Carrillo, J. (2016).

3.2.3. *Ex ante* strategy

A) Competitive strategies

Since its beginnings in the telecommunications market, Huawei has stood out for its after-sales service, product customisation, shorter delivery times and innovation (i.e. pioneering the development of 5G), setting itself apart (**differentiation**) from its competitors[47]. In addition, in 1998, together with IBM, they implemented a restructuring strategy that made it possible to reduce considerably the costs of product development and the time needed to bring a product to market[48]. Huawei has managed to maintain a **dual strategy** by offering high quality products at lower prices than its competitors[49] and by keeping costs down[50]. With its entry into Europe, due to the quality standards required by operators, Huawei intensified this strategy[51] in order to be able to compete in that market.

B) Corporate Strategies

1.- Strategies in the national market

Huawei started its business in 1987 as a distributor of PBX products imported from Hong Kong. In 1993, it launched its own telephone switch (**related diversification strategy** through **backward vertical integration, organic growth**)[52]; this became the most powerful switch available in China, which allowed it to make its way nationally[53] thus initiating its **strategy of penetrating the Chinese market**. It began by setting up facilities in rural areas[54] through agreements[55] with local governments[56].

In 1994 Huawei launched its own integrated access network HONET and the SDH (Data Transmission Protocol Suite) product line. This **product development strategy** (long distance transmitters) allowed it to reach the largest cities in China[57] and to complete the **market penetration strategy**. Since then, and conditioned by the dynamism of the market in which it operates, Huawei has established the **product development strategy** as part of its business model, developing new technologies at regular intervals: its GSM product (standard digital

[47] *Ibid.*
[48] The Epoch Times. (2019, February 6).
[49] Mak, R. (2020).
[50] Fu, K., & Fu, D. (2012).
[51] *Ibid*.
[52] El Comercio Perú (2019).
[53] Arteaga, S. (2020), *Op. Cit.*
[54] El Comercio Perú (2019), *Op. Cit.*
[55] Jenkins, M. (2019).
[56] At that time, China was a country where less than 1% of households had telephone service. So where there was no market, Ren Zheigfei created one by persuading municipal and provincial governments to invest in telecommunications infrastructure.
[57] Jenkins, M. (2019), *Op. Cit.*

mobile phone system)[58], CDMA technologies (used in wireless communications and fibre optic or cable systems) and UMTS (successor to the GRSP and used by 3G mobiles)[59].

Huawei has been expanding into new markets and developing new products in the field of switches, covering all market segments[60], but also in related markets such as router manufacturing[61], following a **related diversification strategy.**

2.- Strategies in the international market

At the end of the 1990s, Huawei began its incursion into foreign markets with the products it had been developing (**market development strategy**). The company has followed a **transnational strategy ("think global, act local")**, based on the adaptation and customisation of local markets, that is, according to the geographical characteristics of its clients for the installation of infrastructures[62], as well as adapting to the legislation in force in each country (regulated sector). In its actions in the international market, the company has been developing **expansion strategies of different kinds and through different mechanisms**, above all focused on **market development and penetration**.

Figure 8: Chronology of market development strategies

Year	Country	Mechanism
1996	**Hong Kong**	**Contractual agreement (organic growth)** with Hutchison Telecommunications
1997	**Russia**	**Joint Venture (inorganic growth)** with Beto Corporation in Russia
1999	**India**	**Direct Investment Abroad** (production subsidiary) **(organic growth):** creating an R&D centre to develop a wide range of telecommunications software**.**
	Brazil	**Foreign Direct Investment** (productive subsidiary) **(organic growth)**[63].
2000	**Sweden**	**Direct Investment Abroad**(production subsidiary) **(organic growth) of the first European R&D Centre**[64].
	Africa	**Contractual agreements (organic growth).**
2001	**U.S.**	**Overseas Direct Investment** (production subsidiary) **(organic growth)** by establishing an office in Texas[65],
	Europe	**Contractual agreements (organic growth).** Germany, France, Netherlands
2003	***Worldwide***	**Shareholder agreement, Joint Venture (inorganic growth)** with 3Com (Massachusetts), focused on enterprise data network solutions[67].

[58] El Comercio Perú (2019), *Op.Cit.*
[59] Arteaga, S. (2020), *Op. Cit.*
[60] Jenkins, M. (2019), *Op. Cit.*
[61] Nieto, J. G. (2019), *Op. Cit.*
[62] Hu, K. (2020).
[63] Asia InfoNews. (2015).
[64] Huawei. (2020).
[65] Micheli, J., & Carrillo, J. (2016), *Op. Cit*.
[67] Huawei (2019). Huawei Corporate Information, *Op. Cit.*

	Market Penetration[66]	**Direct investment abroad** (production subsidiary) **(organic growth):** Opening of offices in France in Boulogne-Billancourt, Issy-les-Moulineaux and Lyon[68].
2005	**UK**	**Alliance (inorganic growth)** with British Telecom for the deployment of its multi-service access network.[69]. Later that year, it signed an agreement with Vodafone, becoming the first Chinese telecommunications equipment manufacturer to receive the title of approved supplier of Vodafone.
	Japan	**Overseas Direct Investment** (production subsidiary) **(organic growth)**: Entry into Japan [70] with the opening of its first office in this country.[71].
2006	**Africa**	**Contractual agreements (organic growth):** Contracts in Ghana, Mauritania, Morocco, Congo and Kenya.
2009	**Norway**	**Alianza (crecimiento inorgánico):** Alliance (inorganic growth): In 2009, Huawei and Norwegian TeliaSonera announced the commercialisation of the world's first LTE network (the 4.5G network) in Oslo[72], becoming a pioneer in this new connectivity[73].
2015	**Belgium**	**Direct Investment Abroad** (production subsidiary**) (organic growth):** opening of the European Research Institute, to coordinate research and innovation efforts in Europe and lead the development of 5G.

Source: Own elaboration

In addition to growth strategies, Huawei has also made **divestments**, with the sale to 3Com of its shares in the Joint Venture in 2011[74], as well as a **restructuring strategy**, through an agreement with IBM in 1998 to adapt to the foreign market and transform its management structure and product line for this purpose[75] which allowed it to be more successful internationally.

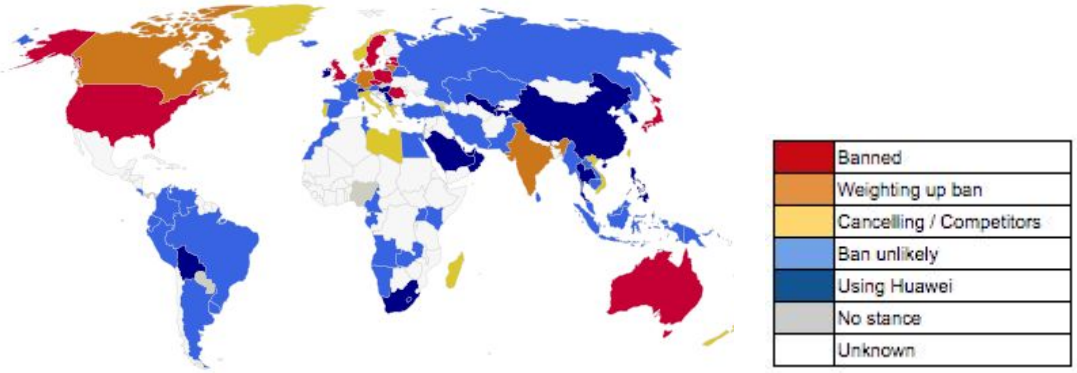
In recent years, Huawei has developed a **new produc**t, 5G, investing $600 million between 2009 and 2013 and $1.4 billion between 2017 and 2018[76]. The 5G is not limited to increasing the performance of mobile phones, but the great potential of this technology lies in its multiple new uses: "*digitised factories, multiplication of 3D production, telediagnosis, remote surgery, the whole of intelligent networks, the generalisation of the internet of things starting with autonomous driving, the superiority of digital clouds over localised servers, artificial intelligence, etc*"[77]. Huawei intends to take advantage of this **first mover advantage** to reach and master the whole world.

[66] Understanding the "European market" as a market.
[68] Huawei (2020), *Op. Cit*.
[69] Ahrens, N. (2013).
[70] Micheli, J., & Carrillo, J. (2016), *Op. Cit.*
[71] Lambert, J., & Logan, A. (2020).
[72] Huawei. (2015, December 14).
[73] Rivera, N. (2016), *Op. Cit.*
[74] Qingqing, C. (2019).
[75] Valdeolmillos, C. (2020).
[76] Huawei. (n.d.). 5G, Gear Up - Huawei.
[77] Nocetti, J. (2020), *Op. Cit.*

3.2.2.The conflict

Following the announcement of the U.S. "veto" decision in May 2019, several countries announced that they were no longer using Huawei's services (cf. Figure 9).

Figure 9: In which countries they have vetoed Huawei 5G (Status July 2020)



Source : New Statesman Tech [78].

Since 2013, Huawei has expressed interest in entering the European market as it is the second largest in telecommunications (after China). This interest has intensified after the US blockade and by early 2020 it had already signed 47 contracts with European operators to bring 5G technology to the US. However, certain markets such as the United Kingdom, Germany and Portugal have created a real barrier to entry for Huawei[79].

A priori, it would appear that customers have a moderate to high market power; however, it should not be forgotten that Huawei was the first in the world (in mid-2018) to make a full end-to-end 5G network available to its customers[80]. This **first mover advantage** has been exploited by Huawei to develop more and deeper than its competitors this new 5G technology, so that the blockade to Huawei can delay in 2 years the deployment of 5G in Europe leading to a big loss of competitiveness if they do not succeed in finding an alternative to Huawei's infrastructure. This is without taking into account the cost of replacing all the infrastructure (**cost of changing supplier**) in the countries where it has already been installed.

Many experts point out that Africa will be the next battleground in the race for Artificial Intelligence[81]. Currently Huawei, together with ZTE, already leads the sale of cheap mobile phones on this continent [82] and the commitment to implement 5G in this territory, although in

[78] New Statesman Tech. (2020).
[79] Jiménez, M. (2020).
[80] Muñoz, R. (2019, June 9).
[81] Prinsloo, L. (2020).
[82] Travaly, Y., Mare, A., & Muvunyi, K. (2020)

the long term, could bring abundant results to the Chinese company as it is an area where 1,200 million people currently live[83].

3.2.3. *Ex post* strategy

The initial response from Huawei's customers to break off business relations with it has completely revitalised its **strategy of development and market penetration**. Huawei has had to rethink where it can continue its internationalisation process with 5G without political limitations by signing agreements and alliances with new countries.

- **Attempting to assault the coveted Europe**: The enormous weight that Huawei has in the European economy (the veto could have an impact of 12.8 billion euros per year [84]. Thanks to this "soft ban", Huawei can avoid the entry barriers by means of strategies that allow it to go beyond them, for example **through licences or private partnerships** with European companies so that while some offer the core infrastructure, the Chinese company can offer the RAN (radio)[85] provided that it is able to adapt to European standards[86] and achieve the highest possible level of cyber security capable of protecting privacy.

- **Expansion to other markets:** The easiest option for Huawei to expand is to try to enter countries that are ideologically more akin to China, ergo less susceptible to geopolitical conflicts, and so memoranda of understanding have been signed and 5G networks launched in some of these regions[87]. Last August, Huawei's CEO revealed that the increasing US sanctions have led to the transfer of its investments in the US to Russia (i.e. in June 2019 through an **agreement** with the Russian telecommunications firm MTS to develop 5G technology[88]) and in South America (i.e. in May 2020 5G technology was presented as a pilot project by Movistar and the Bogota Health Secretariat that will use it to monitor the body temperature of its employees and detect possible cases of coronavirus[89]).

Huawei has already materialised the 5G **product development strategy** in the Chinese domestic market[90], bringing this technology to Shenzhen (China) in August 2020.

[83] Cano, L. (2018).
[84] Fernández, E. (2019).
[85] The *core* is the heart of the 5G network and where all customer information resides. A possibility in Europe is to exclude Huawei from the core limiting the company to the RAN only (the radio), which is the peripheral area.
[86] To convince the European authorities, it opened a Centre for Cybersecurity and Transparency in Brussels (2019).
[87] New Statesman Tech. (2020), *Op.Cit.*
[88] Empresa y Negocios (2019) and BBC News. (2019).
[89] Forbes (2020).
[90] *Ibid*.

4.- CONCLUSIONS

First. Contextualization. Huawei was created in 1987, experiencing exponential growth since then, becoming one of the leading companies in the global technology sector. However, its connection with the Chinese country has caused the enterprise to be subjected to important political blockades by the United States of America which has undoubtedly affected its business strategy.

Second. Strategies on electronic equipment. In the electronic equipment market, Huawei is the largest smartphone manufacturer and also the leader in sales. Before the burst of the conflict, the company applied the following strategies: (a) in terms of competitive strategy, it was able to lead in costs and, at the same time, differentiate itself from other players in the market; and (b) strategies of market penetration, product development, market development and diversification (corporate strategies) have been performed by the corporation. The conflict cut off many of Huawei's supply lines, which has forced it to rethink its strategy, pivoting its business model and its decision into "make or buy". The solution for this problem has been vertical integration, which has served to reduce its dependence on the US and thus to avoid serious damages from the blockade.

Third. Strategies on telecommunications. Huawei also stands as one of the leaders in the telecommunications market. To achieve this position, the company has been using corporate strategies in the national and international market. In China, Huawei implemented a market development strategy by elaborating new technologies at regular intervals. The company also tried to conquer foreign markets through a transnational strategy that used different mechanisms to achieve market development and penetration. However, its route map has shifted, as the European and American restrictions are blocking its current and potential markets, which has caused a limitation on competition and the establishment of an artificial entry barrier (imposed by bureaucracy), mitigating Huawei's first mover advantage from constituting a 5G monopoly. In this sense, the company has been obliged to find new partners, with similar political beliefs to the Chinese government. However, the corporation enjoys a privileged position in this new technology, being the only provider that has developed the 5G in such an advanced level[91]. In this regard, these strict measures prevent countries from being the most competitive, entailing extra costs in Europe that surpass the 55 billion euros[92].

[91] Cano, F. (2020).
[92] Barzic, G. (2019).

BIBLIOGRAPHY

Abril, G. (2017, November 26). Shenzhen, la ciudad china que conquista el mundo con su tecnología. *El País.* Retrieved from https://elpais.com.

Agencia EFE. (2019, August 19). EEUU retrasa otros 90 días la prohibición de vender suministros a Huawei. Retrieved from https://www.efe.com.

Ahrens, N. (2013, February). China's Competitiveness. Myth, Reality and Lessons for the United States and Japan Case Study: Huawei. *Center for Strategic & International Studies*. Retrieved from https://csis-website-prod.s3.amazonaws.com

Almond, K. (2019, May 22). Huawei, una mirada al interior del gigante tecnológico de China. *CNN*. Retrieved from https://cnnespanol.cnn.com

Arana, I. (2019, November 18). EE UU prorroga otros 90 días la moratoria a Huawei. *Cinco Días*. Retrieved from https://cincodias.elpais.com.

Arteaga, S. (2020, July 11). Huawei: la historia de la compañía fundada por un ingeniero con 3.000 dólares y 3 empleados. *Computer Hoy*. Retrieved from https://computerhoy.com.

Asia InfoNews. (2015, May 20). Huawei eleva imagen de marca en Brasil. Retrieved from http://asiainfonews.com/.

Aslop, T. (2020, March 2). Huawei's semiconductor expenditure 2013-2019. *Statista*. Retrieved from https://www.statista.com.

Banco Mundial. (n. d.). PIB per cápita (US$ a precios actuales). Retrieved from https://datos.bancomundial.org/.

Barzic, G. (2019, June 7). Europe's 5G to cost $62 billion more if Chinese vendors banned: telcos. *Reuters*. Retrieved from https://www.reuters.com

BBC News (2019, June 6). Huawei signs deal with Russian telecoms firm to develop 5G. Retrieved from https://www.bbc.com

Bodemer, K. (1998). La globalización. Un concepto y sus problemas. *Nueva sociedad*, vol. 156, no 1, p. 54-71.

Bown, C. P. & Kolb, M. (2020, August). Trump's Trade War Timeline: An Up-to-Date Guide. *Peterson Institute for International Economics.* Retrieved from https://www.piie.com

Brown, S. C. (2020, August 25). The Huawei ban: Everything you need to know. Android Authority. https://www.androidauthority.com

Brownlee, M. (2019, May 21). *The Huawei Ban: Explained!* [Video file]. Retrieved from https://www.youtube.com/watch?v=qZGpmWrVSaU.

Buchholz, K. (2020, February 25). Huawei Is Leading the 5G Patent Race. *Statista*. Retrieved from https://www.statista.com.

Bureau of Industry and Security, U.S. Department of Commerce. (2020). *Entity List* [Press Release]. Retrieved from https://www.bis.doc.gov.

Bush, T. (2019, April 9). PESTLE Analysis of Huawei: How China Affects Its Success. *PESTLE Analysis*, *SWOT and Business Analysis Tools.* Retrieved from https://pestleanalysis.com/.

Brandom, R. (2020, September 4). It will cost $1.8 billion to pull Huawei and ZTE out of US networks, FCC says. *The Verge*. Retrieved from https://www.theverge.com/.

Canalys (2020, July 30). Huawei trumps Samsung for first time in worldwide smartphone market in Q2 2020. Retrieved from https://www.canalys.com.

Canhoto, A. (2017, April 25). Smartphone manufacturing costs vs retail prices. *Blog Ana Canhoto*. Retrieved from https://anacanhoto.com/

Cano, F. (2020, October 19). Huawei supera la certificación de seguridad 5G de la GSMA en medio de la nueva ofensiva europea de EEUU para vetarlo. *El Español*. Retrieved from https://www.elespanol.com.

Cano, L. (2018, September 26). La explosión de la población africana solo acaba de empezar. *ABC*. Retrieved from https://www.abc.es.

Chau, M. & Reith, R. (2020, July 1). Smartphone Market Share. *IDC*. Retrieved from https://www.idc.com.

Chávez, A. C., Reyes, R., & Pérez, P. S. (2006). La estrategia competitiva que adopta la empresa transnacional en el mercado global. *Contaduría y administración*, (220), 89-121.

China Go Abroad. (2012). Huawei Now World's Largest Telecom Equipment-Maker. Retrieved from http://www.chinagoabroad.com

Chitkara, H. (2020, July 31). Huawei surpassed Samsung as the global leader in smartphone shipments thanks to its market share in China. *Business Insider.* Retrieved from https://www.businessinsider.com.

Counterpoint Research. (2020, August 27). Global Smartphone Market Share: By Quarter. Retrieved from https://www.counterpointresearch.com.

Do, T. (2019, November 25). The Real Production Costs of Smartphones. *TechWalls*. Retrieved from https://www.techwalls.com/production-costs-of-smartphones/.

Dmitrijevs, R. (2020). Research on Marketing Strategy of Huawei Mobile Phone in European Market. *Open Journal of Business and Management*, 8, 1138-1150.

El Comercio Perú. (2019, May 21) ¿Quién fundó Huawei? La historia de la empresa china de celulares sancionada por Estados Unidos. Retrieved from https://elcomercio.pe

El Confidencial. (2020, May 25), La innovación de Huawei: 5G, 85.000 patentes y 86.000 millones en I+D. Retrieved from https://www.elconfidencial.com.

El Nacional. (2020, June 25). Huawei, Apple, Alphabet i Amazon les companyies més innovadores de 2020. Retrieved from https://www.elnacional.cat.

Empresa y Negocios. (2019, June 6). Huawei firma un acuerdo para desarrollar la tecnología 5G en Rusia. Retrieved from https://www.estrategiaynegocios.net.

Faulkner, C. (2019, May 21). Can Huawei make a phone without US parts?. *The Verge.* Retrieved from https://www.theverge.com/.

Fernández, E. (2019, November 4). Huawei se afianza en Europa y superará el veto comercial de EEUU «muy pronto». *El Mundo*. Retrieved from https://www.elmundo.es.

Forbes (2020, May 11) Movistar y Huawei inician los primeros pilotos de 5G en Colombia. Retrieved from https://forbes.co.

Fu, K., & Fu, D. (2012). Research on European marketing strategies of Huawei technology Co. Ltd and it's enlightenment on Chinese enterprise. *International Journal of Innovative Management, Information & Production*, 3(1), 25-35.

Gartenberg, C. (2020, May 13). Donald Trump extends Huawei ban through May 2021. *The Verge*. Retrieved from https://www.theverge.com/.

Gascón, M. (2020, September 10). Huawei lidera el mercado de equipos de telecomunicaciones a nivel mundial. *20 Minutos*. Retrieved from https://www.20minutos.es.

Gibbs, S. (2018, August 1). Huawei beats Apple to become second-largest smartphone maker. *The Guardian*. Retrieved from https://www.theguardian.com.

Goasduff, L. (2020, June 1). Gartner says global smartphone sales declined 20% in first quarter of 2020 due to COVID-19 impact. *Gartner*. Retrieved from https://www.gartner.com.

Hu, K. (2020, November 16). To a Digital Decade and Beyond. *Huawei BLOG.* Retrieved from https://blog.huawei.com.

Huang, W. (2019). *Built on Value: The Huawei Philosophy of Finance Management* (p. 456). Springer Nature.

Huawei. (n.d.). *5G, Gear Up - Huawei* [Video File]. Retrieved from https://carrier.huawei.com

Huawei. (2020, November 20). History. Retrieved from https://huawei.eu/who-we-are/history.

Huawei (2015, November 15). Huawei adquiere la participación de Symantec en la Joint Venture Huawei Symantec. Retrieved from https://www.huawei.com.

Huawei (2019). Huawei Annual Report 2019. Retrieved from https://www.huawei.com.

Huawei (2019). Huawei Corporate Information. Retrieved from https://www.huawei.com.

Huawei (n. d.). Supply Chain Responsibilities. Retrieved from https://www.huawei.com.

Huawei. (2015, December 14). TeliaSonera Norway and Huawei demonstrate the world's first and fastest live 4.5G network-huawei press center. Retrieved from https://www.huawei.com.

Hsieh, K. (2020, August 3). Competition in Mobile Base Station Market to Intensify as Global 5G Development Enters Upswing, Says TrendForce. *TrendForce.* Retrieved from https://www.trendforce.com/.

Iglesias, G. R. (2017, May 24). ¿Por qué comprar un móvil Huawei?. *Jazztel*. Retrieved from https://www.jazztel.info/movil-huawei/.

Jenkins, M. (2019, May 14). Foro: La sorprendente historia de Huawei. *La Nación*. Retrieved from https://www.nacion.com.

Jiménez, M. (2020, July 30). Las operadoras móviles en Portugal rechazan usar equipos Huawei en el núcleo de sus redes 5G. *Cinco Días*. Retrieved from https://cincodias.elpais.com.

Kharas, H. & Hamel, K. (2018, September 27). A global tipping point: Half the world is now middle class or wealthier. *Brookings*. Retrieved from https://www.brookings.edu.

Lambert, J., & Logan, A. (2020). The economic impact of Huawei in Japan. Retrieved from *Oxford Economics.* https://www.oxfordeconomics.com.

Maizland, L. & Chatzky, A. (2020, August 6). Huawei: China's Controversial Tech Giant. *Council on Foreign Relations*. Retrieved from https://www.cfr.org.

Mak, R. (2020, July 27). Breakingviews - China's Huawei holds a 5G trump card. *Reuters.* Retrieved from https://www.reuters.com.

MarketLine. (2020, November 12). Huawei Technologies Co Ltd. Retrieved from https://advantage-marketline-com.sare.upf.edu.

MarketLine. (2020, June). MarketLine Case Study. US sanctions on Huawei. No winners from trade war, the US stands to lose technology dominance. (N.o MLCS0001-007).

Martín, A. M. (2019, May 21). Huawei: el gigante que es mucho más que sus móviles. *El Independiente*. Retrieved from https://www.elindependiente.com.

Mcloughlin, M. (2019, July 2), La verdadera historia tras la guerra del 5G (y el veto a Huawei): todo lo que debes saber. *El Confidencial*. Retrieved from https://www.elconfidencial.com

Micheli, J., & Carrillo, J. (2016). The globalization strategy of a Chinese multinational: Huawei in Mexico. *Frontera norte*, *28*(56), 35-58.

Millán, J. (2019, May 21). Donald Trump da tres meses de tregua comercial a Huawei. *20 Minutos*. Retrieved from https://www.20minutos.es.

Mira Cómo Se Hace. (2020, May 18). ¿Cuáles son los mejores sistemas operativos para teléfonos móviles más usados?. Retrieved from https://miracomosehace.com.

Muñoz, R. (2019, May 20). Google rompe con Huawei, cuyos móviles se quedarían sin sus 'apps' y actualizaciones. *El País*. Retrieved from https://elpais.com.

Muñoz, R. (2019, June 9). La nueva guerra fría del 5G. *El País*. Retrieved from https://elpais.com.

New Statesman Tech. (2020, July 29). The definitive list of where every country stands on Huawei. Retrieved from https://tech.newstatesman.com.

Nieto, J. G. (2019, July 1). Huawei y Estados Unidos, una cronología del conflicto: origen, bloqueo, «desbloqueo» y un espionaje todavía. *Xataka Android.* Retrieved from https://www.xatakandroid.com.

Nikkei Assian Review. (n.d.). Anatomy of Huawei's latest model. Retrieved from https://asia.nikkei.com/.

Nocetti, J. (2020). La geopolítica del 5G. *Vanguardia dossier*, (77), 20-23.

OCU. (2020, July 1). Huawei: las limitaciones de no contar con los servicios de Google. Retrieved from https://www.ocu.org.

Oti Telecom (2017, December 18). En el mundo hay más celulares que humanos. Retrieved from https://otitelecom.org.

Peña, C. (2018, September 10). Cinco razones por las que Huawei superó a Apple. *Paréntesis*. Retrieved from https://www.parentesis.com/.

Pongratz, S. (2020, September 7). Key Takeaways – The Telecom Equipment Market 1H20. *Dell d'Oro Group*. Retrieved from https://www.delloro.com.

Pratap, A. (2020, September 3). Smartphone industry pestel analysis. *Notesmatic*. Retrieved from https://notesmatic.com.

Porter, M (1998, August 4). Competitive Strategies: Techniques for Analyzing Industries and Competitors

Prezi. (2015, 3 August). Dirección estratégica Huawei. Retrieved from https://prezi.com.

Prinsloo, L. (2020, August 19). Huawei strengthens its hold on Africa despite U.S.-led boycott. *Bloomberg*. Retrieved from https://www.bloomberg.com.

Qingqing, C. (2019, October 15). Huawei wins most 5G contracts in Europe. *Global Times*. Retrieved from https://www.globaltimes.cn/.

Reuters. (2020, January 15). Timeline: Key dates in the U.S.-China trade war. Retrieved from https://www.reuters.com.

Rivera, N. (2016, March 2). El imperio Huawei: del anonimato chino al dominio global. *Hipertextual*. Retrieved from https://hipertextual.com/.

Solís, I. P. (2019, March 7). Así han aumentado los costes de fabricación de los Samsung Galaxy S. *El Androide Libre*. Retrieved from https://elandroidelibre.elespanol.com/.

South China Morning Post. (2020). US-China trade war timeline. Retrieved from https://multimedia.scmp.com/widgets/vert_timeline/?id=tradewarannv.

Sputnik Mundo. (2019, June 29). Huawei depende de más de una docena de componentes estadounidenses en sus celulares. Retrieved from https://sptnkne.ws/mM7Z.

Tao, T., & Chunbo, W. (2015). The Huawei Story. *Thousand Oaks*, Canadá: SAGE Publications.

TechAltar. (2020, August 5). *1 year later - Did the Huawei ban work?* [Video file]. Retrieved from https://www.youtube.com/watch?v=cqILB-3aCUg.

The Economist (2019, January 12). The maturing of the smartphone industry is cause for celebration. Retrieved from https://www.economist.com.

The Epoch Times. (2019, February 6). La historia de Huawei: el rol de IBM y Cisco. Retrieved from https://es.theepochtimes.com.

Thibout, C. (2020). Las grandes potencias de la inteligencia artificial. *Vanguardia dossier*, (77), 6-13.

Travaly, Y., Mare, A., & Muvunyi, K. (2020). África, el próximo campo de batalla. *Vanguardia dossier*, (77), 34-39.

Valdeolmillos, C. (2020, September 9). Empresas con historia: Huawei. *MuyComputerPRO*. Retrieved from https://www.muycomputerpro.com.

Wong D. & Koty, A. C. (2020, August 25). The US-China Trade War: A Timeline. *China Briefing.* Retrieved from https://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/.

Wong, S. (2020, April 30). China: Huawei revenue 2019. *Statista*. Retrieved from https://www.statista.com/.

Yan, S. (2017, February 27). 'Made in China' isn't so cheap anymore, and that could spell headache for Beijing. *CNBC*. Retrieved from https://www.cnbc.com.

ANNEXES

ANNEX 1: Market analysis

Huawei designs, manufactures and markets telecommunication network equipment, IT products and solutions and intelligent devices. We will now proceed to analyse two of the markets in which it operates: Smartphones and telecommunications.

A.1.1. Analysis of the generic environment (macro-environment)

As Huawei operates worldwide this analysis will be done from a global perspective of Political, Economic, Social, Technological, "Environmental" and Legal (PESTEL) factors[93].

Political	Governments currently play a very relevant role in the area of international business, with government and regulatory oversight of technology companies being more than evident. An example of this, and the object of study of the project, is the impact that the trade war between the United States and China is having.
Economical	The economic situation has a direct impact on important economic factors such as employment, poverty and consumer purchasing power. Huawei mainly manufactures in China and then sells abroad, so if Huawei's target markets perform well economically, Huawei will probably sell more phones in that market. From 2015 to 2018, global GDP has been on a rising trend[94], with the middle class having access to electronic devices and telecommunication networks increasing[95]. The Covid-19 has caused economic activity worldwide to decline and an economic recession is expected to generate a decrease in GDP, an increase in unemployment ... The direct impact on smartphone sales is a 20% decrease in users during the first quarter of 2020[96]. As for the Chinese market in particular, beyond the growing number of smartphone purchases, it is interesting to note the growth in labour costs, causing Huawei's expenditure to increase proportionally[97].
Socio-cultural	New technologies are part of the new lifestyle of people around the world: people want to be connected to everyone instantly. An unfortunate socio-cultural factor affecting Huawei is the widespread association of Chinese products with poor quality.[98] On the other hand, one has to take into account the "no screen" campaigns that fight for the decrease of the use of electronic devices because this is associated with psychological damage.

[93] Pratap, A. (2020).
[94] Banco Mundial (n.d.).
[95] Kharas, H. & Hamel, K. (2018).
[96] Goasduff, L. (2020).
[97] Yan, S. (2017).
[98] Bush, T. (2019).

Technology	Technology is the main factor driving growth and an important source of competitive advantage for brands. The global digital transformation will be articulated through the implementation of 5G networks, as well as the use of Artificial Intelligence in many aspects of life. Huawei enjoys, in this sense, a very advantageous position, since, as has been pointed out, it leads the development of these technologies, called to be the biggest revolution in the technological and industrial sector in decades.
Environmental	The focus on sustainability, sustainable sourcing and manufacturing, as well as sustainable processes, has grown.
Legal	As a technology company, Huawei must take special care with the area of patent law (protecting its designs without "copying" the rest). In addition, it has to manage the numerous consumer laws in the different markets in which it operates as well as laws related to security and data protection and privacy.

A.1.2. Analysis of the competitive environment

A.1.2.1 Competence

Huawei operates in two markets (smartphones and telecommunications) characterised by high competition:

One of the elements determining competition is market saturation, taking into account the number of companies operating in the market and their ability to power or control it. The tool used has been the Herfindahl-Hirschman Index (HHI):

$$HHI = s_1^2 + s_2^2 + s_3^2 + \ldots s_n^2$$

With "S" being the percentage market share of company N.

Figure A1.1: Market shares of the smartphone market in 2020

Huawei	20,20%
Samsung	19,50%
APPLE	13,60%
Xiaomi	10,30%
OPPO	8,70%
Others	27,80%

Source: IDC[99]

Figure A1.2: Market shares of the telecoms market in 2020

Huawei	31%
Nokia	14%
Ericsson	14%
ZTE	11%
Cisco	6%
Others	24%

Source: Dell'Oro Group[100]

[99] Chau, M. & Reith, R. (2020), *Op. Cit.*
[100] Pongratz, S. (2020).

In the smartphone market (which is a mature market[101]), the five world leaders account for 72.3% of sales. From the data available to us, we know that the rest of the smartphone vendors worldwide will have less than 8.7% market share (market share of OPPO, the fifth largest seller of mobile devices worldwide). Assuming that they all sell 8.6% means that we have 3 more companies:

$$HHI = 20{,}2^2 + 19{,}5^2 + 13{,}6^2 + 10{,}3^2 + 8{,}7^2 + (8{,}6^2 \times 3) = 1.376{,}91$$

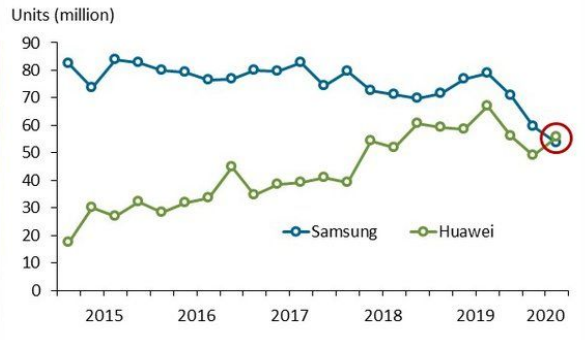
In the telecommunications market, the five world leaders account for 76% of sales. From the data available to us, we know that the other selling companies will have less than 6% market share; assuming that they all sell 6% means that we have 4 more companies:

$$HHI = 31^2 + 14^2 + 14^2 + 11^2 + 6^2 + (6^2 \times 3) = 1.649{,}24$$

Both markets are **concentrated** (few companies share most of the market share) and in both markets Huawei is the world leader:

- Since 2012, after overtaking Ericsson, it leads the telecommunications market. It is currently the world leader in 5G base stations and in their commercial deployment with a market share of 28.5%, surpassing Ericsson and Nokia, Huawei's main competitors[102]. In addition, Huawei is the company that is leading the development of patents and, therefore, contributing in Mayr to the consolidation of the 5G standard[103].
- Since 2020, after overtaking Korea's Samsung and despite Huawei's difficult situation, Huawei is the world leader in smartphone sales[104].

Figure A1.3: Worldwide sales of Samsung and Huawei smartphones (Q1 2015 - Q2 2020)



Source : Canalys [105]:

[101] The Economist (2019).
[102] Hsieh, K. (2020).
[103] Buchholz, K. (2020).
[104] Canalys (2020), *Op. Cit.*
[105] *Ibid.*

Costs from one mobile phone manufacturer to another or from one telecommunications provider to another are low. Finally the investment needed to provide these technological products/services becomes an exit barrier. All this **increases rivalry between competitors in the sector.**

A.1.2.2 Threats from new competitors

Oligopolies are characterised by high entry barriers and the telecommunications and smartphone markets are no exception. Offering telecommunications services and selling mobile devices requires infrastructure, patents, IT development... which make it difficult for new competitors to enter. Moreover, the fact that these are industries where innovation is part of the business model of companies makes it even more difficult for a new company to catch up.

The threat of new entrants is a very weak force because of the current economies of scale from which the four main competitors benefit; however, if you have the capacity to break through these entry barriers, once you are inside you do not get much retaliation from competitors. In the specific case of smartphones in recent years new names such as Opp, One Plus, BQ have started to make inroads into the market.

A.1.2.3. Threat of substitutes

Mobile phones perform such a number of very different functions and currently there is no product that covers all the needs of a mobile phone at once.

As far as the telecommunications market is concerned, substitutability is a characteristic feature.

A.1.2.4. Buyer's bargaining power

The bargaining power of customers/buyers comes from their ability to influence business decisions to enjoy better conditions in terms of price or product conditions. In the technology markets in which Huawei operates the number of customers is extremely high (e.g. eight out of ten people have mobile coverage in the world[106]) and they have a wide range of companies from which to choose the most suitable price and product features to supply them; there is a difference in products.

As far as switching costs are concerned, if we understand as a buyer to an individual, in the smartphone market the cost of switching devices is low, you can change your phone without having to stay with the same brand. As regards the cost of change for potential 5G buyers

[106] Oti Telecom (2017).

(governments and large companies), these have to make a large initial investment to provide the territory with the initial infrastructure, ergo the cost of change is high.

A.1.2.5. Negotiating power of suppliers

In both markets, suppliers have moderate to high market power due to several factors. There are (for most items) several suppliers producing the same item, but as a counterbalance we have that telecommunication and mobile device suppliers depend on the reliability and quality of each process in the supply chain.

ANNEX 2: Company analysis

A.2.1. Resources

Tangible	● Physical: The value of its assets is 122,947 million euros. ● Financial: Huawei's revenues in 2019 amounted to USD 122,972 million, with an operating margin of 9.1% and a net profit of USD 8,971 million.
Intangible	● Reputation: The company is certified for its quality and management systems[107]. However, disputes related to the violation of intellectual property (Cisco, T-Mobile, Motorola, ZTE...) or human rights (exploitation of workers, collaboration in the persecution of ethnic groups in China), as well as those related to cyber security or espionage of its users in the service of the Chinese government. In addition, Huawei has also been accused of violating the international economic sanctions imposed on countries such as Iran, Iraq, Syria and North Korea[108]. ● Technology: The company has invested $86 billion in R&D and holds over 85,000 patents. In 2019 alone, it registered 3,525 new applications[109]. About 30,000 were granted in China and over 40,000 in Europe and the United States[110]
Human	● Huawei has over 180,000 employees worldwide, highly qualified, with education abroad and in the best schools in China[111]. In 2019, the company allocated $36.89 billion in human capital. Of the 15,000 workers who are dedicated to basic research, more than 700 are doctors specialised in mathematics, more than 200 are doctors specialised in physics and chemistry and more than 5,000 are doctors specialised in engineering[112].

[107] MarketLine. (2020, November 12).
[108] Maizland, L. & Chatzky, A. (2020).
[109] El Confidencial (2020).
[110] El Nacional (2020).
[111] Almond, K. (2019).
[112] Huawei (2019). Huawei Corporate Information, *Op. Cit.*

A.2.2. Capabilities

or the study of the company's capacities we will make a first approximation through a functional analysis that allows us to identify the organizational capacities in relation to each of the functional areas of the company[113].

Functional area	Capacity	Explanation
Corporate Management	Financial Control	The debt ratio is 65.6% and has been decreasing compared to 2015 and 2016. Both income and operating profit have shown an upward trend over the last five years.
	Management development	Management rotation. Ability to adapt to the environment: by this I mean, for example, that they have developed their own app shop.
	Multidivisional coordination	Huawei is looking for a structure where at the top are the departments of the headquarters, in the middle the operational departments and at the bottom the implementation departments.
	Acquisition management	Huawei, in implementing its growth strategies has merged and acquired numerous[114]
	International Management	Huawei operates in over 170 countries and regions[115].
R&D and product design.	Research	High investment capacity in innovation and research centres. The company invests more than 10% of its annual sales revenue in R&D, some 16,730 million euros in 2019. Total investment in R&D over the last decade has reached almost 89,000 million euros. Some 49% of its employees, some 96,000, work on R&D projects. For the third consecutive year, it was the main corporate applicant for PCT patents in 2019, according to the World Intellectual Property Organisation [116]. It currently invests between $3 and $5 billion a year in "Research and Innovation", employing about 15,000 workers, including more than 700 doctors specializing in mathematics, 200 doctors specializing in physics and chemistry, and 5,000 doctors specializing in engineering.

[113] *Ibid*.
[114] MarketLine (2020, November 12), *Op. Cit.*
[115] Huawei (2019). Huawei Corporate Information, *Op. Cit.*
[116] El Nacional (2020), *Op. Cit* and Huawei (2019). Huawei Corporate Information, *Op. Cit.*

		They have established innovation and development partnerships with over 300 universities and more than 900 research institutes and companies[117]. In addition, the Huawei Institute of Strategic Research was established in 2019 to investigate future market trends.
	Innovation in the development of new products	70% of its R&D budget goes to product development. In this sense, the company has developed the IPD system/plan with which they intend to train their employees in current business trends, specifically so that they learn to incorporate customer needs into products quickly and accurately[118].
	Design capacity	To stand out especially in the design of electronic devices such as smartphones, tablets, smartwatches...
Operations / Manufacturing.	Efficiency in manufacturing volume	Huawei can produce equipment for the entire chain. It manufactures everything from smartphone chips, to routers, core and other network infrastructure elements. Huawei has made the most technical contributions to the 5G standards, more than 10,000, compared to 8,400 for Ericcsson and 5,800 for Nokia[119] Huawei wanted to remove the obstacles that were blocking the competitiveness of Chinese companies: high transaction costs, an inefficient supply chain and a weak capacity to integrate business systems. To do this, Huawei took advantage of IBM for the organisational aspects of internationalisation and outsourced operators that were not key to the end of the value chain: manufacturing, assembly, delivery and logistics, which have made an integrated supply chain system a necessity to have workshop and inventory[120].
	Flexibility and speed of response	Huawei adjusts its production line and technological processes according to market share and rapidly changing conditions and markets[121].
Marketing	Quality reputation	Huawei has managed to establish a favourable presence in the device market, so its current policy is to avoid price wars. Previously, the company based its strategy on competing on price, but now they aim to win customers with high quality products and services rather than low prices..
Sales and distribution	Effectiveness of promotions	Huawei uses a variety of promotional methods to achieve market expansion (sales staff, promotions, advertising, etc.). For example, at a European level the company has achieved good results with the use of local celebrities and football clubs (such as Leo Messi or Atlético de Madrid)[122].

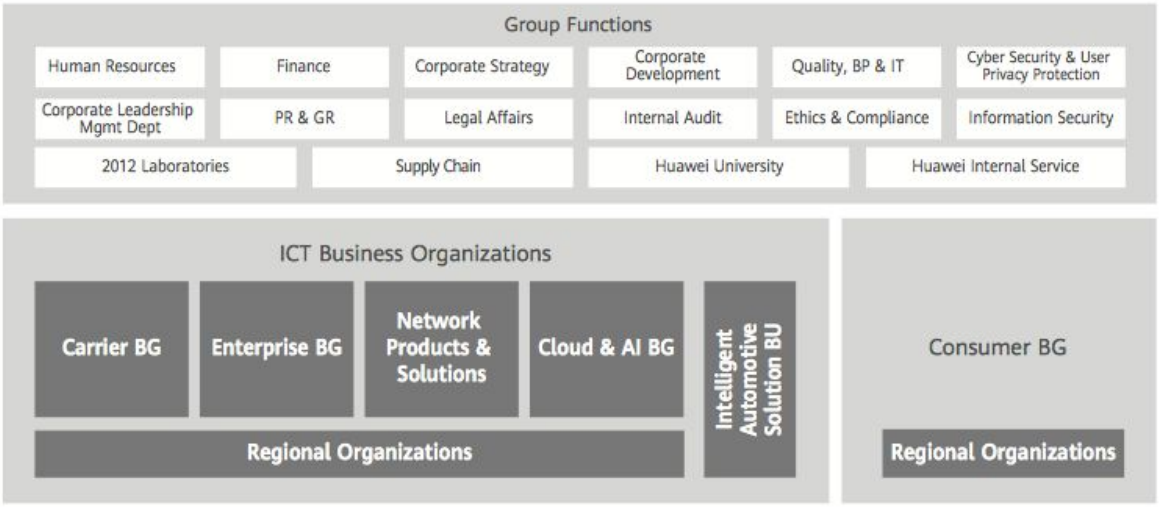
[117] *Ibid.*
[118] Huang, W. (2019).
[119] Mcloughlin, M. (2019).
[120] Micheli, J., & Carrillo, J. (2016), *Op. Cit.*
[121] *Ibid.*
[122] Dmitrijevs, R. (2020).

	Efficiency and speed in order processing	Huawei works closely with suppliers to ensure that through technology, demand forecasts, purchase orders and supplier inventory can be controlled. This allows the company to know its demand and be able to generate the right supply to meet it[123].
	Customer service	By 2019, Huawei had more than 2,600 consumer service centres in 105 countries, offering after-sales repair service. During that year, the company increased its overall customer satisfaction by 8 percentage points and accepted more than 1,000 suggestions and requests from consumers related to the optimisation of products and services[124].

ANNEX 3: Structure and financial data of Huawei

A.3.1. Huawei's departmental structure

Figure A3.1. Business structure (2019)

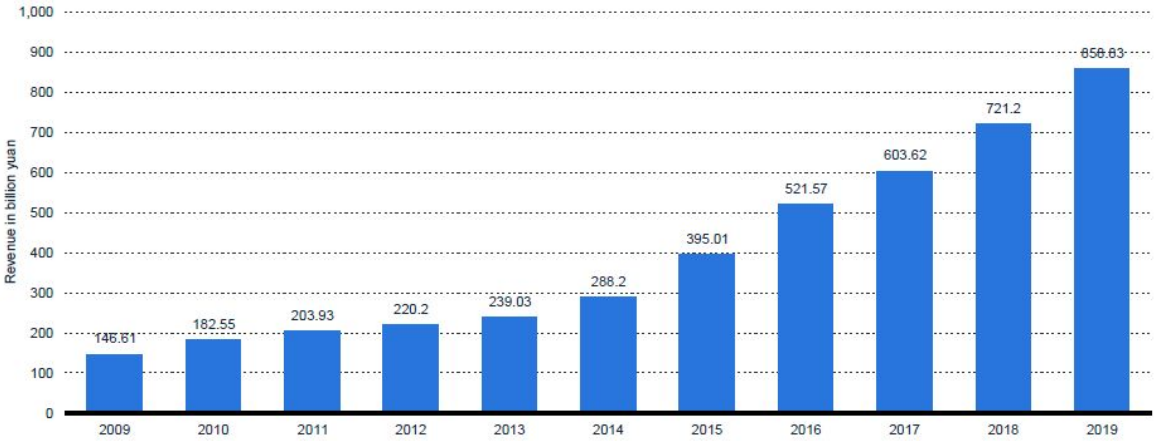


Source: Huawei Financial Annual report[125]

[123] Huawei (n. d.). Supply Chain Responsibilities, *Op. Cit.*
[124] *Ibid.*
[125] Huawei (2019). Huawei Annual Report 2019.

A.3.2. Huawei Financial Results

Figure A3.2: Huawei's revenue from 2009 to 2019 (in billions of yuan)



Source: Statista[126]

Figure A3.3. Profit and loss account (2015 - 2019)

	2019		2018	2017	2016	2015
	(USD Million)	(CNY Million)	(CNY Million)			
Revenue	**122,972**	**858,833**	721,202	603,621	521,574	395,009
Operating profit	**11,145**	**77,835**	73,287	56,384	47,515	45,786
Operating margin	**9.1%**	**9.1%**	10.2%	9.3%	9.1%	11.6%
Net profit	**8,971**	**62,656**	59,345	47,455	37,052	36,910
Cash flow from operating activities	**13,085**	**91,384**	74,659	96,336	49,218	52,300
Cash and short-term investments	**53,127**	**371,040**	265,857	199,943	145,653	125,208
Working capital	**36,890**	**257,638**	170,864	118,503	116,231	89,019
Total assets	**122,947**	**858,661**	665,792	505,225	443,634	372,155
Total borrowings	**16,060**	**112,162**	69,941	39,925	44,799	28,986
Equity	**42,316**	**295,537**	233,065	175,616	140,133	119,069
Liability ratio	**65.6%**	**65.6%**	65.0%	65.2%	68.4%	68.0%

Notes: 1. Converted into United States dollars ("USD") using the closing rate at the end of 2019 of USD1.00 = CNY6.9840
2. Starting from January 1, 2019, the Group has applied IFRS 16 in preparation of its financial statements. Details about the changes to related accounting policies can be found in note 4 to the consolidated financial statements summary. As permitted by the standard, the Group has used the modified retrospective approach for transition. Comparative information has not been

Source: Huawei Financial Annual report[127]

[126] Wong, S. (2020).
[127] Huawei (2019). Huawei Annual Report 2019, *Op. Cit.*

ANNEX 4: Google App and its alternative in Huawei[128]

Sector	App	Available at the Huawei app store?	Do all options work?	Official alternative if it doesn't work
Social Networks	Instagram	No	-	Web version
	Facebook	No	-	apk oficial
	Twitter	No	No	Non official apps store
	Tiktok	Yes	Yes	-
	Snapchat	Yes	Yes	-
Messaging	Whatsapp	No	-	apk oficial
	Telegram	Yes	Yes	-
	Facebook Messenger	No	No	No
	Discord	No	--	No
Video calls	Zoom Meetings	Yes	Yes	-
	Google Meet	No	-	No
	Google Duo	No	-	Web version
	Google Classroom	No	-	Web version
	Houseparty	No	-	No
	Jitsi Meet	No	-	No
	Skype	No	-	No
Games	Candy Crush	Yes	Yes	-
	Clash Royale	No	-	No
	Fornite	No	-	No
	Pokémon Go	No	-	No
	Call Of Duty	No	-	No
	Brawl Stars	Np	-	No
	Mario Karts	No	-	No
GPS/Maps	Google Maps	No	-	No
	Maps.Me	Yes	No	-
	Waze	No	-	No
Leisure	Spotify	No	-	No
	Deezer	Yes	Yes	-
	Shazam	No	-	No
	Netflix	No	-	No
	Dazn	No	-	No
	Disney +	No	-	No
	Clan Rtve	Yes	Yes	-
	Youtube	No	-	No
	Amazon	Yes	Yes	-
	Aliexpress Shopping	Yes	Yes	-
Utilities	Google Play Store	No	-	No
	Google Keep	No	-	Web version
	Google Chrome	No	-	No
	Gmail	No	-	Web version
	Google Drive	No	-	Web version
	Midgt	No	-	No
	Infojobs	Yes	No	-

[128] OCU. (2020).