A Work Project presented as part of the requirements for the Award of a Master's Degree in Management from the Nova School of Business and Economics.

Analyzing the Sustainability of Apple's Competitive Advantage

Work project carried out under the supervision of:

Professor Luís Almeida Costa

17.12.2021

Acknowledgments

Our deep gratitude goes first to our supervisor, Professor Luís Almeida Costa, who expertly guided us through this experience. His support and relentless supervision were of the utmost importance for the finalization of this thesis. We thank him for believing in our group from the start and for being supportive of our professional projects whilst this thesis occurred. Without him this dissertation would not have been possible.

We would like to thank Nova University for the opportunity to further complement and explore our knowledge in a brilliant way. Additionally, to each one of the authors of this thesis: the remaining group holds a debt of gratitude to you. Life holds big things for you.

Lastly, we would like to thank our family members and friends, who not only support us unconditionally but incentivize us to do and be better.

Abstract

This report presents the case study “Competitive Position of Apple Inc. in 2021”, which describes Apple’s current overall business situation while presenting a comparison to its competitors. This case was designed to be studied at both master and executive level. Furthermore, on this thesis a case analysis is also presented. Following the guidelines of this Field Lab, said analysis starts by reviewing the relevant literature to understand the competitive situation of Apple. Additionally, both an industry and a company analysis were performed by applying the literature review concepts, while also studying the disruptive innovation linked to Apple. So far, Apple’s current strategy is not sustainable in the long run due to both high dependence on one product and to the deviation of consumer’s brand perception

Keywords: Strategy; Company Analysis; Disruptive Innovation; Apple; iPhone; Tim Cook

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Table of Contents

Introduction 1
Case Study 2
History of Apple Inc 2
The Birth of Apple 2
Sculley's Roller-Coaster and The Fallen Apple 3
The Jobs Magic 4
Cook Takes the Helm 5
Apple Inc. and its Core Strategy 6
Apple's Financial Panorama 8
Smartphone Sector 10
The Market 11
Competitive Landscape 12
Research and Development and New Technologies 13
The iPhone 15
iPhone's Strategy 16
Computers and Tablets 18
The Market 18
Competitive Landscape 19
The Mac 21
The iPad 22
Wearables 23
Wearables in the Healthcare Industry 23
The Market 24
Competitive Landscape 25
The Apple Watch 27
The AirPods 28
Services 29
Apple Pay 29
iTunes, Apple Music and the AppStore 30
Apple TV+ 30
iCloud 31
Challenges Ahead 31
Case Analysis 33
Literature Review 34
Sustainability of Competitive Advantage 34

Isolating Mechanisms 35
Unique Resources 37
Privileged Market Position 38
Disruptive Strategies for Value Creation 40
Industry Analysis 43
Analysis of the Smartphone Industry 43
Porter's Five Forces Analysis 44
Company Analysis 46
Why Apple Does Not Hold a Cost Leadership Strategy 46
Apple's Differentiation Strategy 47
The iPhone's Competitive Advantage 49
The Apple Brand 50
Apple's Concerns in China 52
Disruptive Innovation 54
Sensing Capabilities 54
Attitude Towards Risk 55
Apple Matured in its Business Cycle 57
Incentives for Disruptiveness 58
Recommendations and Conclusion 60
Appendixes 63
References 82
Case Study 82
Case Analysis 88

The following thesis is using all information available until the 30th September 2021. Any changes concerning product introductions or financial figures after this reference date are not taken into account.

Introduction

This work project presents the case study "Competitive Position of Apple Inc. in 2021" which is designed to be taught in strategy courses at both the master and executive level (M.Sc.; MBA). The case focuses on Apple's history and its business current situation and strategy. Moreover, an extensive view is provided regarding several industries in which the company positions itself, complementing it with the study of Apple's major products and its competitors. Henceforth, an analysis of the case report is conducted. This analysis comprises the smartphone industry, the company and respective iPhone's competitive advantage, as well as Apple's consumers' brand perception. Apple's approach towards disruptive innovation as a response to the sustainability of their competitive advantage was also under analysis.

By doing so, it is concluded that Apple's strategy towards innovation changed as a consequence of both external and internal factors. Nonetheless, it could still represent a very important factor for Apple as it can provide, if well executed, solutions for the two main problems of why Apple's strategy cannot be sustainable in the long run. Moreover, the probable causes for Apple's lack of disruptive movements were also under discussion.

The information for the case report was obtained through publicly available sources such as existing case studies, industry reports and up to date newspaper articles from well-established sources. The literature review was built based on several articles and studies considered relevant in the application to the case analysis, resorting to sources such as the Harvard Business Review or the Journal of Management.

Case Study

Competitive Position of Apple Inc. in 2021

Tim Cook was wondering around his office as he had just seen Apple's financial statements and reports regarding 2020. Even though the result was once again reflecting an excellent performance, there was a dilemma that concerned him. There had been a time where Apple was the face of disruptive innovation, but those days were over. How would he overcome this problem? Apple's CEO was stuck with an obstacle and a whirlwind of thoughts: "Can Apple rely on iPhone revenues for much longer? How will I strive for disruptiveness? How can I attain significant market share for other products? Covid-19 was really the least of our problems…".

History of Apple Inc.

The Birth of Apple

To understand the genesis of Apple, one must travel to Silicon Valley where Stephen G. Wozniak and Steven P. Jobs met. Their shared passion for electronics was rapidly transformed into a business opportunity when they started building "blue boxes"[1]. The common interests of the two friends cemented the intimacy between them, which allowed Jobs to be a first-hand *connoisseur* of Woz's first computer basic design. By acknowledging the potentiality of that equipment, Jobs incentivized Woz to found a company of their own. Moreover, he was the one to name it Apple. Hence, Apple Inc. was officially created in 1976 on April Fools' Day.

The Jobs family garage became the assembling stage for their first computer – Apple I. From there, Jobs assured to secure the funding and Woz the electronic improvements to keep the company going, which later resulted in the Apple II computer. Alongside with this, the experienced businessman A. C. "Mike" Markkula Jr. joined Apple as a new partner responsible for securing the capital necessary and projecting a business plan. Apple II's success took the computer industry by blast, since it was the first personal computer specifically directed to the

marketplace. Furthermore, in less than three years the personal computer industry grew to $1 billion in annual sales, setting an unequaled event[2].

Despite its enormous popularity, Apple knew that at any given moment its fiercest competitor - International Business Machines (IBM) - would enter the market, but they felt prepared: "We're the guys with one-third of a million installed base. We're the guys with a software library. We're the guys with distribution. It's IBM who is reacting and responding to Apple", said at time president Markkula. However, IBM had major success not only with the buyers, but with other producers, gaining a dreadful market share. The IBM's computer had a relatively open architecture with a Microsoft's disk operating system and a central processing unit from Intel. This opened the market for manufacturers to replicate their design, enhancing even more other players in the industry. While into those unprecedented appalling times, Apple replaced their CEO by John Sculley.

The company responded to the ongoing crisis by introducing the Macintosh to the world. Despite all efforts, it did not work as expected causing the company to enter in a seriously troubled era. Thus, a high-tension climate was being lived and the differences in Job's and Scully's management styles were enhanced, resulting in Jobs departure from Apple.

Sculley's Roller-Coaster and The Fallen Apple

The post-Jobs time was one of the most prosperous for Apple. Sculley was able to tremendously grow the business in nearly a decade due to the rising popularity of the Macintosh. In 1989, the launch of the Mac Portable could have been considered the next move of greatness from Apple, would not it be its inflated price and problems with the screen and weight. The new Mac weighted roughly the same as the original one but was competing with much lighter and cheaper laptops, culminating in a crisis. Henceforth, confident that his marketing background was enough, Sculley nominated himself CEO of Apple and took Apple's Newton Project as an

opportunity to save the company. This project took Sculley's full attention, consequently creating a disregard towards the Mac. The result was a company at risk and the confirmation that Sculley was a marketer in a technology company and not a technologist. John Sculley was replaced by Michael H. Spindler in 1993[3].

Spindler's tenure was short. After being nominated CEO, he immediately extinguished the recent plan of putting Mac OS on Intel chips. Besides announcing to the world that Apple would certify companies to make Mac clones, he also strived for the international growth of the company. Even so, Apple's 1996 first fiscal quarter demonstrated the contrary, which culminated on the nomination of a new CEO, Gilbert F. Amelio, a board member[4].

It is fair to state that Amelio only popped by for a visit at Apple's CEO chair. Even though hired for his reputation as a corporate rehabilitator, his attempts to innovate the Mac OS were failed and sales continued to drop. Still in 1996, the company purchased NeXT STEP, an operating system founded by Jobs after leaving Apple. Nevertheless, that was not enough to fix Apple's tragic situation. Jobs returned as a part-time advisor and convinced the board that Amelio needed to be dismissed. Most industry watchers and even loyal clients believed that Apple was right on track to reach bankruptcy in only a few weeks.

The Jobs Magic

Steve Jobs was back and moved quickly to save the company. Alongside with a massive board's reorganization, he announced a patent cross-licensing and technology agreement with Microsoft. The five-year agreement allowed Apple to develop core products, while Microsoft endorsed the benefits of it, due to its involvement in "alleged anticompetitive practices". Job's strategic moves alongside with his vision, resulted in his nomination as an interim CEO. In the interest of increasing sales, Jobs closed a deal with one of the biggest computers reseller companies, while simultaneously launching the Apple Store. Moreover, for the sake of lowering

the company's costs Jobs deployed manufacturing to Taiwan while scaling down the distribution system[5].

The firm's line of products adopted a new strategy aiming to simply have four lines of products: desktop and portable computers designed for the consumer markets or the professional users. Following this momentum was the iMac's launch, an all-in-one computer with endless features and pleasing to the eye aesthetic, thanks to Jonathan Ive.

The company's overall image required a boost, and the "Think Different" campaign staring major personalities like Martin Luther King asking the public to think differently, did exactly that. Eventually, Steve Jobs accepted the CEO full-time position and throughout the following years Apple never stopped to innovate with products like iTunes or the iPhone. Indeed, Jobs painted the most brilliant years of Apple.

Cook Takes the Helm

Steve Jobs fought a hard battle with cancer. After a liver transplant he considered that it was time for someone to fill in his shoes, personally inviting Timothy D. Cook, Apple's COO, to take over in August 2011. Unfortunately, after a couple months his death shook the world[6].

Tim Cook had been handed a company which was facing rising competition and the loss of its visionary, but he did not get overwhelmed. Ultimately, Apple became the first trillion-dollar company in the world. Looking into the big picture, Cook was successful in many areas, from the iPhone as a massive industry leader, to computers, wearables, and services growth pairing with it. The Apple Watch was Tim Cook's first major product, which is until now a triumph not only to the company's usual fans, but also in the health industry. Among other vanguard moves, one can highlight Cook's determination to make Apple a greener company that considers environmental policies and sustainability a key question.

Apple Inc. and its Core Strategy

Apple Inc. is an American multinational corporation with headquarters in the United States (Cupertino, California) that designs, manufactures, and markets software products and consumer electronics. The company is popular for its products such as the iPhone, iPad, and Macintosh computers. However, their software simplicity, like the iOS or the OS X, alongside with their related services, are also responsible for Apple's popularity. In recent years the company has been focusing in designing and manufacturing wearables, home devices and accessories like the AirPods, Apple Watch and the Apple TV.

Apple operates hundreds of retail stores in many countries, while being present in online platforms. Additionally, its products are sold under third-party cellular network carriers, wholesalers, retailers, and resellers. Apple's core market are not only regular consumers, but also small and medium-sized companies, as well as education and enterprise markets.

Apple has been awarded several times by the BusinessWeek magazine as the most innovational company in the world[7]. To unveil Apple's strategy, the first step is to travel to the heart of the company – its CEO. Although Apple continues to be governed by Jobs' values of efficiency and innovation, currently Tim Cook is focused on another level. Reduce-cost actions like rationalizing the warehouse and reducing the number of key suppliers entail some of it[8].

Apple's ecosystem is the core of the company's strategy, hardware, and applications. In fact, Apple's ecosystem acts both as a resource and a strategy. Not only consumer's loyalty is directly targeted, but both hardware and software are developed, controlled, and manufactured internally[9]. The Mac became the pivot of this vertical integration strategy, through the patented iOS system and its recent M1 ship processor. By offering premium products, combining leading-edge technology and aesthetic designs, Apple targets the high-end segment of the market. Therefore, in turn for the higher prices, Apple provides elegant and intuitive user-friendly products, enriched by the advantages of being part of a complete ecosystem[5].

Apple's narrow product line facilitates the unification of product management, customer care and marketing[9]. On this matter, Apple resorts to offering its products as part of a lifestyle, showing how they can impact the day-to-day life, beyond technical specifications. Moreover, before a product launch, it is presented in the respective Apple event, which is usually streamed to the eyes of the world, and then supported by an advertisement campaign[10].

Apple stores are a strategic move themselves. In May of 2021 the company had a total of 511 stores across the world, fundamental to control the distribution of the products, but also to build a relationship with the customers (see Exhibit 1). As regards to this experience, the consumer walks into a store with a minimalistic, luminous, and elegant design while having highly qualified employees to assure a good customer experience. Additionally, Apple fights off the show-rooming effect by preserving an equal price system in all online and offline stores, resulting in the neutralization of online competition[10].

For the sake of controlling the company's vital functions, there are eleven executive departments (CFO, COO, Legal, Design, iOS software, Operations, Retail, Software Engineering, Product Marketing, and Global Communication) headed by senior vice presidents and the CEO[10]. Hence, crucial functions like design and innovation are controlled from the inside, on the Apple Park, the company's infinite loop shaped campus. Antagonistically, functions that can be furnished by others in a more efficient manner, as manufacturing, are outsourced.

Concerning the manufacturing process, Apple relies on suppliers at a global term, but there is a significant concentration in the low-cost Southeast Asia, particularly in China, Taiwan, and South Korea[11]. Besides reviewing the manufacturing process to the minimum detail, Apple holds a strict control over workers[12]. The apple shaped company chooses flight transportation as its main channel, due to the strong and often urgent demand. In abridgement, Apple acquires components and materials from different suppliers, which get shipped to an assembling factory

in China and are delivered as a final product directly to consumers by air transportation. Posteriorly, Apple's retail stores, which daily adjust production forecasts to the perceived demand, make the product available to the public[12]. Alternatively, products are also shipped to customers via UPS and FedEx delivery systems. Besides operating as delivery systems for Apple, these companies integrate a reverse supply chain strategy. UPS and FedEx handle the products' request for returns, recycling returns or the ones due to personal displeasures[12,13].

Sustainability is another Apple's strategy pillar, having been awarded by Greenpeace with a B-grade: A for the usage of renewable energy and B for the elimination of hazardous materials[14]. Furthermore, the company is committed to become carbon neutral by 2030 and it is already supporting nature-based projects that aim to remove carbon from the atmosphere[15].

Marrying Apple's resources and capabilities with the morals of the company alongside with a singular ecosystem, carve its existent strong brand image. The strength of the company's strategy lies on the combination of advanced technological features with a seamless user experience, supported by an attractive minimalist design.

Apple's Financial Panorama

Apple's revenues have been increasing at an above-average pace throughout the years (see Exhibit 2). By the end of 2020 Apple accounted a $274 billion revenue. Due to its higher level compared to the full fiscal year of 2020, the $282 billion generated until the third quarter of 2021 reinforces that the company is still growing (see Exhibit 3). Moreover, in 2021 Apple's market capitalization was $2.343 trillion. Regarding 2020's revenues it is also important to notice that if one disaggregates revenues, roughly half of the total cake corresponds to iPhone sales which accounted for $137.8 billion, followed by services with a much lower percentage of it: $53.8 billion (see Exhibit 4).

The cost of goods sold (COGS) is a little volatile when it comes to Apple (see Exhibit 2). Even so, in 2020 COGS of $169.5 billion coincided with a lower percentage of total revenues. 2021 is reasoned the same way since by the end of the third quarter COGS' value was $164.8 billion but reflected a lower margin as compared to revenues (see Exhibit 3). Hence, the company may have better aligned prices with raw materials[16]. Even though Apple keeps increasing investments on the research and development segment, the growth rate at it is doing that has been noticeably shrinking.

Cash is an important asset to be considered: it is the product of a company's activities which allows to meet expenses and cover investors payment. It may even be called the lifeblood of a business. By the third quarter of 2021 Apple's cash and cash equivalents were valued at $34 billion, which indicates that it will at least equal 2020's result if variables stay as they are (see Exhibit 3). The conservative growth of short-term investments may indicate that there are little additional projects to invest in, which from an investor's point of view may be worrying.

Long-term debt is also meaningful especially due to an interesting twist in 2020. Until 2019 Apple's long-term debt followed the path towards reducing its total value, being at the stated time $91.8 billion. Notwithstanding, this value escalated and by the third quarter of 2021 it was registered at $105.8 billion (see Exhibit 2 and 3). It may come as a surprise but taking on debt during the Covid-19 pandemic era may be surprisingly useful since the company is able to sustain operations even with lower revenues. Even so, through the investors' lens, return on equity should be increasing side-by-side with debt, otherwise they would be facing more risks than rewards.

Within financial ratios lies the true ability to analyze a company's performing capabilities. Liquidity ratios, for example, give a clear measure of the solvency capability of a company, specifying if it is possible to meet short-term obligations. The cash ratio for Apple has been growing. The 0.36 value in 2020, contrarily to what was previously stated, indicates that the

company does not hold an enormous amount of cash and may be doing its short-term investments in a clever way (see Exhibit 5). Asset ratios, on the other hand, allow to have an understanding over the efficiency of a company's management team. Apple's total asset turnover at the end of 2020 was 0.85, which was a resulting improvement of the past years (see Exhibit 6).

An essential topic for every investor and the entire ecosystem around a company is profitability, making tools like the return on equity ratio one of the most necessary. Apple's return on equity has been colossally increasing throughout the years, having reached the end of 2020 with an 87.8% equivalent (see Exhibit 7). Even more, as of this moment Apple's stock price is at $142.83. As previously stated, by being correlated with the increased accumulation of debt, this increment represents a good sign. It means the company is generating capital on borrowed money, which it was used as well for growth and operational purposes. Other ratios could have been considered, but the ones referred allowed for a comparison between raw data and ratios' conclusions.

Smartphone Sector

The smartphone industry only begun to embody the demeanor it has today in 2007 when Steve Jobs shocked the world with the launch of the first iPhone. The iPhone was the landmark of the first successful touch screen device, arriving at a time where societal needs as communication, information, and entertainment were urgent to be filled.

In fact, the iPhone blitzed the smartphone era in a way that since its genesis more than 24,000 different types of analogous gear have been released[17].

The Market

The difference between a more flexible and customizable system versus one known for its simple user interface and thorough security is shown on Exhibit 8. On one side, Android led the market with a share close to 72%. On the other side, iOS's smartphones account for 27.5%. In fact, iOS devices are positioned exclusively on the premium segment of the market, whereas Android also covers massively the good enough market. Together, both mobile operating systems accounted for 99.5% of the global market share in June of 2021.

Covid-19 had a major impact on the industry, causing delayed shipments and component shortage bites. These circumstances culminated on global sales suffering a setback of 10.5% regarding the number of smartphones sold. That corresponded to a decline from 1541 million units in 2019 to 1379 million in 2020 (see Exhibit 9). Nevertheless, smartphone sales are projected to rebound in 2021, with a total transaction of 535 million smartphones. Accordingly, there was a 26% smartphone sales' increase to end users on the first quarter of 2021 (although the 2020 base of comparison is undoubtedly lower), and a growth of 10.8% on the second quarter, translating into 328.8 million units sold (despite the supply constraints).

The specifications and functionalities expansion in the smartphone world will continue to create a need in the consumer. In fact, besides the predicted 1,557 million units shipped in 2026, for that year there are 7516 million device users forecasted (see Exhibit 10). Those will cluster in the largest populations worldwide, namely China, India, and the United States. Both previously stated Asian countries are foreseen to remain the smartphone user leaders, due to a low device penetration rate. Additionally, drivers like the increase of disposable income, design development and emerging budget-centric smartphones will also contribute to the upsurge of the Asian smartphone market. On the other hand, higher smartphone penetration rates are more common on countries with leading economies such as the United States. In 2020, 81.6% of the

US population owned a smartphone, followed by the United Kingdom and Germany with a corresponding 78.9% and 77.9% share (see Exhibit 11).

Unlike in previously stated countries, Apple is struggling to hold market share in the Chinese market. Instead, this market is dominated by national smartphone companies as Vivo, Oppo, Honor and Xiaomi. As of the third quarter of 2021, Apple retained 13% of the market share, the smallest percentage out of the five main players. For the same quarter, Vivo was the market leader with a 23% share, followed by Oppo with 20%, Honor with 15% and Xiaomi with 14%. Despite Apple's lower market share, it still represents a 62.5% increase when compared with the same quarter of the previous year.

Currently, the smartphone market is evaluated in $378.29 billion and is presaged to grow at a Compound Annual Growth Rate (CAGR) of 6.85% until 2026, reaching a value of $493.13 billion.

Competitive Landscape

Apple and Samsung wrestled alone for the title of brand with largest share for years, with emphasis on the high-end segments. However, as the low and good enough customer segments grow, emerging Asian brands are gaining more traction and establishing themselves as a threat. Xiaomi led the way regarding changing the competition landscape, by offering quality-rich phones at affordable prices. Albeit the key hardware features remain similar, among smartphones of distinct brands the price and branding remain the key differentiators. More recently, Samsung led smartphone market shares, followed by Huawei and then Apple. Nevertheless, Apple tends to occupy the second place in fourth quarters.

Although the smartphone industry constitutes a fast-growing sector, it is becoming saturated and fiercely competitive. In 2020, the market was distinctly led by Samsung (20.6%), followed by Apple (15.9%), Huawei (14.6%), Xiaomi (11.4%) and Vivo (8.6%), leaving the remaining

28.7% share for smaller competitors[18]. It is important to consider that while Apple sells premium products targeting the higher-end segment of society, the other smartphone brands cover a broader customer base.

Exceptionally, in the fourth quarter of 2020 Apple ranked first, taking a market share of 23.4%, driven by the success of the iPhone 12 series. Samsung occupied the second place with a 19.1% share. In the same time frame, Xiaomi gained a prominent position resulting in a 11.2% market share, followed by Oppo with 8.8%, both getting ahead of Huawei. This company suffered from a Google license cancelation and United States' sanctions. As a result, it lacked behind to the fifth place, registering a year-over-year decline of 42.4%[19].

By the second quarter of 2021, Samsung managed to lead the market with an 18% share of shipments, reinforcing the 8% year on year growth. Even so, there was a surprising twist on the competitive landscape. Xiaomi (16%) triumphed on misplacing Apple (15%) from its position, posting year-on-year smartphone shipment growths of 83% and 1%, respectively[20]. Nonetheless, Xiaomi prices are in average 75% cheaper than Apple's, targeting the lower mass market. Yet, the company focus is shifting towards the high-end market, as revealed by the launch of the Mi 11 Ultra model, with a starting price of $928.

Oppo (10.5%) and Vivo (10.1%), are also looking to target premium segments, and ranked next, with 32.6 million and 31.2 million units transacted, accordingly. With the five main companies competing on the same segment, competition will, inevitably, intensify. As expected, Huawei lost its position among the top five. Apple is foreseeable to win back the second slot in the third quarter with the iPhone 13 release, seizing a predicted share of 15.8%.

Research and Development and New Technologies

The smartphone industry's competitive landscape requires companies to urge for innovation and differentiation. In the present moment, modernization entails technologies such as artificial

intelligence (AI), virtual reality, and machine learning. As an attempt of widening the scope of differentiation, which has been decreasing, a massive investment on Research and Development is being enforced. Hence, companies endeavor to respond to the continuous change of customers' preferences.

In this parameter, Huawei, Samsung, and Apple are the leading R&D investors. Huawei stands out with an expenditure equivalent to 22 billion US dollars, a 7.8% increase from the previously homologous period (see Exhibit 12). Similarly, 2020 Samsung's R&D investment accounted $19.55 billion, approximately more 11.7% than the previous year. Whereas Apple spent $18.75 billion in 2020, an increase of 15.6% compared with 2019 (see Exhibit 13 and 14).

The growing availability of new 5G networks has spurred a wider range of moderately priced fifth-generation smartphones, which promises to drive a superior demand in more mellowed markets. The urge of striving in this field is especially strong in markets like the United States, China, South Korea, and Japan, due to their advanced technological conditions and investment. These countries also represent where most cities have the 5G technology available[21].

The 5G migration is particularly strong in China, where the percentage of 5G smartphones is estimated to reach 60% by the end of 2021. Samsung Electronics positioned itself as the pioneer of the 5G smartphone when launching the Samsung Galaxy S10 5G model on South Korea by 2019, thriving in the transformative technology. Other Asian brands followed the lead and asserted themselves by announcing fifth-generation communication devices like the Huawei's Mate 30 Pro 5G and Xiaomi's Mi 10 5G, later in 2019 and 2020, respectively[22]. Apple deferred the launch of its own 5G gadget to October 2020, the iPhone 12, that turned out to be a success.

The iPhone

Launched in 2007, the first iPhone came to refashion the market by revolutionizing the way the phone market matured. Eventually, the iPhone came with an associated trade, in the sense that it led the iPod to failure[23].

In 2010 a new sleek design featuring a high-resolution retina display, a frontal camera, FaceTime, and multi-touch capabilities was presented to the world. In October of 2011 Apple was antagonistically saying goodbye to Steve Jobs and greeting Siri. Alongside with this, a new operating system which came with iMessage, iCloud, space for notifications and a new 8-megapixel camera that allowed 1080p recording quality was included. Subsequently, until the end of 2017 the innovation on the iPhone's models was very marginal, as the iPhones were not more than an evolution product of previous phones.

The celebratory 10-year anniversary of the iPhone was marked by iPhone X introduction. It was the first iPhone to get an OLED display, wireless charging and, at last, a new design[24]. This groundbreaking design language would serve as the basis for the subsequent models. Aside from a slightly better camera, processor and screen, iPhones have been quite similar, and the newly released iPhone 13 is a tangible prove of that. It counts with small improvements like a smaller notch which makes the display a little bit more immersive, a slightly different button placement and a faster processor. The iPhone 13 is available at a starting price of $699 regarding the iPhone 13 mini model, going all the way to the $1599 iPhone 13 Pro Max with full specifications[25].

Considering the iPhone 13 Pro and Pro Max, one can verify that the Samsung Galaxy S21 Ultra and Plus, priced respectively at $999 and $1529, are in a slightly higher price range. Thus, Apple engages in a slightly lower pricing technique, even if alongside with Samsung they sustain the two companies with higher price ranges. Notwithstanding, Apple´s cheapest

smartphone, the $399 iPhone SE, has more than double of the price of the cheapest smartphone of any other big competitor[26].

The previous facts place Apple as a company driven on creating differentiated products at a premium price. In fact, Apple has $229234 million in sales which can be compared to the $170625 million from Samsung, the market leader company, with 4.7% more unit-shipments share (see Exhibit 15). The company not only captures a high amount of sales with a smaller unit market share, but it also profits 2.69 times more when compared to Samsung. Such high profits in the company create a dependency on the iPhone for revenues. In fact, in 2020 more than 50% of Apple´s total revenues were derived from the iPhone, being the product in which Apple relies on the most (see Exhibit 4).

iPhone's Strategy

The iPhone makes both hardware and software technologies intuitive for the user[27]. In fact, it offers a detail-oriented design, with a seamless user experience and a welcoming adaptability for everyone to catch up with. This differentiation allows to lur not only premium product consumers, typically societal upper-class, but also to enlarge the consumer base.

The brand reputation grants access to the middle socioeconomic segment, even if it does not reflect colossally on market shares. As a result of this, Apple can engage in higher selling prices, which strategically generate more profit with less units sold, without compromising the company's success[10]. By marrying brand loyalty, innovation, strong brand image and premium pricing, Apple creates an artificial entry barrier for competitors.

When a new version of the iPhone is introduced, the price generally drops for the older versions. This allows Apple to keep selling old products, while launching new products into the market. In fact, this strategy is one of the biggest contributors to the effect of enlarging the customer base across lower socioeconomic segments[28]. Apple products' line follow a "the less, the better"

premise. It chooses to manufacture one smartphone model as opposed to its competitors like Samsung, that hold and launch dozens of models every year[29].

The launch of a new iPhone model drives thousands of content creators, reviewers, and consumers to make content about it, to write their thoughts and to get their hands on the device. The hype around iPhone releases is higher than in any other smartphone. However, consumers have been transparent with their thoughts through online platforms, specifying that competition seems to be catching up on their preferences.

To assure global product availability, Apple resorts to primary channels of distribution like the Apple stores, which are an essential driver of sales. Its location is usually associated with quality shopping services and urban shopping districts to safeguard that premium feeling and visibility. Additionally, the iPhone distribution strategy is polished with the after-sales services. These are global channels that administer customer support after the items purchase.

Apple's established reputation creates space for minimal publicity in terms of ads or other promotion formats. Hence, Apple conferences and original advertising are the centre of expenditure. The annual conferences give life to an interactive way of enhancing the personality of a new iPhone, creating a sense of intrigue capable of getting orders pulsing within minutes of the event's end[30].

Apple's advertisement campaigns are simple but advanced, smooth but fast-rhythmed, innovative yet showcasing the qualities of the iPhone in the day-to-day life. In abridgement, they embody a short entertainment skin. The iPhone XS Max campaign is a great example: a little girl shows on screen taking pictures of a cat and even her toast, which become bigger after the picture is taken. This results in a quote reflecting the new model's selling point, "Everything you love just got bigger"[29]. Without a doubt, it is safe to state that the iPhone has become a fashion tool directed for entertainment, and each point of its strategy has contributed to it.

Computers and Tablets

The launch of the Apple I in 1976 changed the way the typical household perceived computers, from a machine used by professionals to an everyday commodity. This aspect led to a double-digit growth rate in the subsequent decades[31]. The beginning of the 21st century supplemented an exponential growth of the personal computer industry, whose commercialized products keep having an increasing adherence. Even so, there is a constant query regarding the need for innovation.

The Market

Personal computer shipments have been continuously decreasing at a global level. Notwithstanding, on the first quarter of 2021, sales thundered increasing to 69.9 million units worldwide. That represented a 32% increment when compared to the equivalent quarter of 2020, symbolizing the fastest year-on-year growth of the century (see Exhibit 16). Evidently, such increase was attainable due to a poor first quarter in 2020, when the Covid-19 pandemic emerged. Moreover, numbers of 2021's first quarter are the result of 2020 delayed device shipments. In fact, one can state that the massive numbers' rise could have been stronger if there had not been supply chain issues, such as the global processor chip shortage. Even so, Covid-19 contributed to the skyrocket demand for personal computers, from luxury items to affordable Chromebooks. Logically, it was a consequence of people's needs to work and study remotely.

The wave that incentivized a huge personal computer's demand kept flowing in the second quarter of 2021, accounting for 83.6 million units shipped, more 13.2% relatively to the previous year (see Exhibit 17). As the pandemic slowly fades away of its prime critical status, demand is starting to shift again to the commercial segment. Even so, the global industry is predicted to grow from $145.73 billion in 2020 to $161.19 billion in 2021, resulting in a

Compound Annual Growth Rate (CAGR) of 11.1%. Yet, demand is set to hit a wall: the volume across all segments is estimated to return to pre-pandemic levels by 2022, denoting negative growth rates[32].

Within the industry, laptops have been taking the lead in revenue terms due to its superior unit prices. Indeed, it is foreseen that by the end of 2021 laptops will entail a revenue piece of $125.2 billion (see Exhibit 18). Even so, there are other substantial segments like tablets, PC monitors and desktop PCs which are equally important to this industry. Although a tablet combines the best of both worlds - smartphones and laptops PCs - by "definition a tablet is a highly portable PC whose primary interface is a touch screen that occupies the full length/width but whose speaker and microphone are not positioned for a hand-held calling"[33]. Thus, it is included in the computer segment.

Competitive Landscape

Nowadays the personal computer industry is getting selective in its competition. There is clear evidence of competition concentration and consequently, rivalry among existing companies (see Exhibit 19). In 2020, market leaders combined had a 6% market share growth when compared with 2017, for example. Lenovo stayed ahead of its competitors with a share of 24.9%, close to HP's 21.2%, followed by Dell with 16.4%. Apple's 8.2% ensured the fourth place, whereas Asus and Acer had market shares of 6% and 5.9%, respectively, leaving the remaining 17.5% to others. Whereas Lenovo and Acer tend to focus on the low and mid-range segments, HP, Dell, and Asus, aim for the mid-range and high segments. Contrastingly, Apple ensures an established positioning among premium consumers.

As the industry enters a stage of maturity, companies are increasingly struggling to differentiate among the competition. For instance, Lenovo upscaled its R&D expenditure by 8.85% from 2019/20 to 2020/21, planning to double it in the next three years[34]. Within the analogous period

Dell followed the same strategy, registering a 5.67% R&D growth rate (see Exhibit 20). In fact, Dell has a strong differentiation strategy, since from 2016 it already accounted a 400% growth in R&D. Again, this investment reflects the wish to include IT services on the company's capabilities.

Apple's last years' significant R&D growth rate of 15.6% was in the spotlight as it achieved $18.75 billion[35]. In the computer industry, the 2020's M1 chip stands out as the main output of this investment. With it, Apple simultaneously enriches its ecosystem and drastically reduces its dependence on Intel[36]. As a response, Microsoft just launched Windows 11. Asus, Lenovo, or HP laptops are already equipped with this fresh technology and soon so will be others like Samsung or Dell[37].

On the first quarter of 2021 the market's top vendors remained unchanged, all experiencing double-digit growth, when compared to the analogous time of the previous year. Moreover, both Lenovo and HP overcame their market share, respectively from 23.3% to 25.1% and from 21% to 21.4%. In deterioration, Dell's decreased from 19.3% to 16.5% (see Exhibit 21). Lenovo fortified its leading position by recording 17.5 million shipments, corresponding to a substantial 42.3% year-over-year growth. Interestingly, the highest year-over-year growth was observed outside the top three merchants, with a value of 48.6% belonging to Apple.

The second quarter of 2021 revealed equally promising results. Within this time frame Lenovo reenforced its leadership which translated in a 24.1% market share. HP remained second with a 20% share, yet with the lowest shipment volume growth (8.5%) and Dell came after with a 17.1% market share. Apple Inc. once again placed fourth in the competition, with an 8.5% market share (see Exhibit 22).

The Mac

Apple computers are the choice of many as they represent quality and simplicity. The "Mac" word refers to the umbrella of computers produced by Apple, from the 1984 Macintosh to the state-of-the-art product line of 2021. As for the moment, Apple holds three different portable computers: the MacBook Air, MacBook Pro 13´´ and MacBook Pro 16´´, starting from $999, $1299, and $2399, respectively. Regarding desktop computers, the consumer is invited to pick from a selection of four different models. Two iMacs with 24´´and 27´´, the Mac Pro and the Mac Mini. Their price ranges from $699 for the Mac Mini to $5999 for the Mac Pro[38].

The Mac segment's popularity is rising among consumers, as shown in Apple's 2020 net sales. For the computer sector there was a $2882 million disclosed increase from 2019[39]. As previously stated, the incremental sales are due to the Covid-19 pandemic and the new M1 chip feature. This component, which arrived shortly after to the iMac in 2021, grants computers up to 85% more performance, better resolution, and access to several capabilities not possible before. Additionally, its 8-core CPU with four high-performance cores and four high-efficiency cores, doubles the battery life of the devices[40].

Alongside with a higher acquisition cost, MacBook models last longer (a seven-year average) and have a superior residual value when reselling or trading. Consequently, their true cost of ownership (acquisition cost – residual value) is cheaper when compared to a Windows PC. Moreover, due to the small selection of Mac devices there are less viruses for macOS. Besides, the Windows operating system can be installed on Apple devices, whereas macOS cannot be run anywhere else outside the ecosystem[41].

In June 2021, the macOS operating system used across all Apple's desktop products captured 15.56% of the market share, whereas Windows had a market share of 72.98% (see Exhibit 23). Linux, Chrome OS, and other operating systems secured the remaining market share, clearly arising as smaller players in the industry.

The iPad

"If there's going to be a third category of device it's going to have to be better at these kinds of tasks than a laptop or a smartphone, otherwise it has no reason for being", Steve Jobs stated when introducing the iPad for the first time[42]. Realizing that a considerable portion of its users were not fully exploiting their computer devices, Apple launched the iPad. This is a powerful device, with a striking display and a responsive touchscreen that came to substitute the traditional keyboard. Hence, the iPad came to undertake specific tasks in a way it complemented the usage of iPhones and Mac devices. Once again, Apple enriched its ecosystem by creating a segment by itself.

As of today, Apple's iPad structure is composed by four different products: iPad Pro, iPad Air, iPad, and the iPad mini. The price goes from the $329 iPad mini, all the way to $2399 for the iPad Pro with full specifications[43]. Despite its agile success in the beginning, sales stabilized as innovations in the tablet league did not flourish. In September of the current year (2021) Apple already sold 23610 thousand dollars' worth of iPads, representing a 78.9% year after year growth. The introduction of the M1 chip on iPads (and Macs), created a spike in sales which explains it. Again, people value a powerful machine when working from home.

When specifically analyzing tablet devices, Apple led the market with a 31.9% share in 2021's second quarter (see Exhibit 24). One can compare it to Samsung's 19.6%, which is followed by Lenovo and Huawei with 11.6% and 5.1%, accordingly. In fact, on this matter consumers esteem better products with a higher quality over the premium price.

The fact that the 10 best performing tablets currently in the market are all iPad models, only reinforces this statement[44]. Moreover, in 2020 Apple's Macs and iPads continued to rank first regarding customer satisfaction, according to the American Customer Satisfaction Index. With an 82% customer satisfaction rating, Apple surpassed all computer and tablet manufacturers

(see Exhibit 25). The winning score entails both laptops/desktops, and tablets. However, iPad's customer satisfaction stands out, with broader margins than the MacBook.

Wearables

Over the last decade, there has been a surge in the popularity of wearables, as both companies and consumers are beginning to use these devices for a variety of applications. Showing no signs of slowing down, the industry has allowed for a wide range of benefits through technological advancements. This is transversal to industries such as healthcare, manufacturing, clothing, travel, and tourism, amongst others. The increasing adoption of this gadget has placed wearables in the front line of the Internet of Things. Even though the industry is segmented in an extensive spectrum of products from wristwear to eyewear, the wristwear segment is indisputably the most relevant.

Wearables in the Healthcare Industry

The Internet of Things (IoT) has the potential to transfer data through devices, connecting them without the requirement of direct human interaction. This technology has created innumerous new opportunities for electronics to emerge, connecting homes, cities, cars, or even the industrial internet, among many others[45].

The marriage between the IoT and wearables emerged in the healthcare industry as a revolutionizing element for technological development and social change. In fact, it was the smartwatch that took healthcare into another level. It encompasses fitness trackers and health self-monitoring with features such as heartrate sensors, blood pressure trackers, pulse oximeter, and sleep monitoring[46]. Moreover, Covid-19 may be responsible for some of the recent growth of the industry. A study conducted by students from Stanford University School of Medicine, found that 81% out of 32 people potentially positive for Covid-19 revealed data on their

wearable devices that indicated signs of early infection[47]. Simultaneously, the demand boost was also pushed by the lockdown restrictions and consequential work from home routines.

The monitorization of health indicators can be lifesaving, but it can also represent damage to the customer. The prevention of malicious access may not be reinforced, or the allocation of data to third parties not properly managed. As one can image, an insurance company that has access to health data is not likely to provide health insurance to a customer that does not show the best vital signs[48]. On that thought, industry players should either limit the data shared to third parties or share it anonymously.

The Market

Covid-19 dealt a blow in the prosper growth of the industry, as manufacturing units temporarily closed. Even so, the pandemic improved wearables' importance along healthcare and fitness industries. Hence, in 2020, the worldwide wearable industry shipped 444.7 million gadgets, representing a substantial growth of 28.4% from 2019.

Whilst the industry entails a wide variety of products, earwear and wristwear account for most of the market, with 62% and 36% sales' share in 2020[49]. Consequently, just 2% were left for other segments. Nonetheless, smartwatches included in the wristwear category are expected to take the lead of wearables in the future. Last year, ear-worn and smartwatch technologies recorded an astonishing 234.3 and 91.4 million units sent, respectively (see Exhibit 26). Adding to this, they had the higher end-user spending among the industry, $32.72 billion in ear gadgets and $21.76 billion in smartwatches.

In 2021, the numbers remain encouraging, so as the most popular product categories. In the second quarter roughly 114 million wearable technologies were shipped, which represents an increase of 10 million units from the first quarter of the year. As shown in Exhibit 27, all segments registered positive evolutions. Earwear shipments rose from 64.6 to 72.1 million

units, watches surged from 26.4 to 26.9 million units, and wristbands stepped up from 13.1 to 14.6 million. While both categories have seen a substantial year-over-year growth of 39%, wristbands shipments have been continuously decreasing. Overall, it is expected that end-user spending on wearables will totalize $81.5 billion by the end 2021, an 18.1% increase from 2020[50].

The worldwide growth prospects prevails positive, as the industry is far from being saturated. For instance, in 2024 the two leading categories are expected to ship 552.6 million units together. Moreover, by 2026, a valuation of $38650 million is forecasted for the wearables industry as a whole[51].

Competitive Landscape

The wearables technology is a market led by few established players. Nonetheless, the attractiveness of this industry is raising the interest of many smaller companies, such as start-ups. Even so, the limited players' capacity to invest in R&D, alongside with competitors' communities and loyal customers, create significant strategic entry barriers.

Clearly Apple was positioned as the market leader in 2020, having shipped 151.4 million units of wearables, corresponding to a 34% market share (see Exhibit 28). The first runner was followed by Xiaomi (11,4%), Huawei (9,8%), Samsung (9%) and the losing steam brand Fitbit (2,9%). Apple's results speak for themselves: taking revenues into account, the Apple Watch, AirPods, and Beats headphones are a $30 billion per year business. This would rank solely Apple wearables as a Fortune 100 company[52].

In the first quarter of 2021, Apple sustained its leading position yet with a smaller market share of 28.8%. Samsung's 11.3% share remained steady, despite its significant 35.7% year-over-year growth. In the analogous quarter, Xiaomi suffered a market share drop from 13.3% to 9.7%, whereas Huawei remained with its regular 8.2%. However, appraisals should be centered

in BoAt, that tripled its market share from 0.9% to 2.9%, recording a colossal 326.8% year-over-year growth (see Exhibit 28).

On the second quarter of 2021, Apple registered 32.2 million shipments, which translated in a 34.1% market share. Xiaomi returned to last year's market share, 11.8%, whereas Huawei experienced a negative evolution of 22.2% to 9.8%. On the other hand, Samsung remained with the 2020 second quarter's 8.2% market share (see Exhibit 28). Xiaomi is catching up Apple, and has already surpassed the high-end brand Samsung. BoAt's podium place was replaced by Imagine Marketing, who recorded a market share of almost 1%, meaning a 478% growth over the same period last year, corresponding to 4.6 million shipments.

Regarding the smartwatch segment in 2021, Apple rules the market with a massive 52.5% market share in the second quarter, which corresponds to 9.5 million shipments. Light years away, Samsung and Garmin follow with 11% and 8.3%, respectively (see Exhibit 29). On the other hand, lower price points, usually associated with other companies rather than Apple, were pivotal for the industry growth. In fact, the sub-$100 smartwatch segment massively grew 547% this last year.

Competitors are trying more than ever to have an Apple's resembling leading margin. Facebook, for example, presented how it is using a smartwatch-like device as a guide for a pair of AR glasses. However, Apple quickly responded by introducing AssistiveTouch, which allows the watch's control without the need of touching it. Identically, Google and Samsung joined forces on the new Galaxy Watch 4, powered by Wear OS 3. This companies went further and acquired Fitbit to take advantage of their wearable market, simple user experience, longer battery life, and user data[53]. Although Samsung shipments skyrocketed 114% in the second quarter of 2021, Apple's dominance in the business did not tremble. The company seams to still benefit from its advantage with the early launch of successful Apple Watches, but also due

to its connected ecosystem. Oppo and Huami (Zepp) are examples of companies developing in-house solutions for their watches.

The Apple Watch

The Apple Watch entered the market as an iPhone extension, with features such as receiving calls, sending messages, managing the calendar, exploring notifications or GPS navigation. However, its focus has been shifting towards healthcare, using several health and activity indicators. More recently, apart from other capabilities, ECG reading, and blood oxygen tracking were added as new features.

From 2019 to this moment, Apple is delivering a product that is putting the Swiss watch industry to shame. Apple has sold more units on that time frame than all Swiss watchmakers combined, including Tissot and Tag Heuer[54]. In fact, Apple did not strip the iPhone interface of the users' wrist but adapted the traditional watch dial to Apple Watch's digital crown.

Apple just launched the Apple Watch series 7 (September 2021), with a starting price of $399. It follows the same design as previous generations, but has a larger screen, advanced displays, a sturdier body, longer battery life and faster battery charging. Alternatively, the lower-cost Apple Watch SE, available from $279, offers well-being and basic activity capabilities, but misses some premium features. Among this, an always-on display, blood oxygen measurement, ECG, and different case materials. Nonetheless, other models are also available like the $399 Nike Apple Watch which is directly indicated for exercising. The new luxury Hermès Apple Watch starting at $1229, promises to be success as well[55].

In December 2020, the company reached the important milestone of having 100 million Apple Watch users, corresponding to 10% of iPhone owners. When considering the U.S. market, the attach rate is higher, with 30% of the iPhone users already converted[56]. The popularity of the Apple Watch keeps growing, with new exclusive services designed for the device, such as

Fitness +. Moreover, health will continue to be the Apple Watches' core, as the Series 8, scheduled for 2022, is expected to use a new set of infrared sensors for measuring glucose.

The AirPods

Apple just launched the third generation of AirPods with shorter stems designed to a better fit. This was the first design change in AirPods since their 2016 introduction. Through the H1 chip and the Adaptive EQ to the user's unique ear shape, the new AirPods model assures enhanced sound quality[57]. Evidently, these upgrades are the result of an exhaustive R&D investment, which involved ear scans and heat maps, having the customer experience in mind.

Moreover, the device support on spatial audio with dynamic head tracking, is already included in premium models like the AirPods Pro and AirPods Max. Spatial audio is a nifty feature that makes it sound like the audio is coming from all around the room. For example, on a group's FaceTime call, voices are assigned locations based on where people's boxes sit on the call[58]. AAC-ELD, a speech codec to enable full HD voice quality, is also comprised.

The AirPods' battery life has been lengthened, meaning that now a single charge grants six hours of listening or four hours of talking. In fact, within just five minutes of charging the battery will last for an hour. In a parallel move, the case's battery life was also improved, offering space for four complete charges[59]. To complete the new model, there is an IPX4 rating, meaning that AirPods 3 are resistant to sweat and water.

The cutting edge $179 AirPods 3 already joined the AirPods Pro and Max, with the respective price of $249 and $549, being all available at the distance of a credit card. Alternatively, Apple is lowering the entry-level price for AirPods, by cutting the price of AirPods 2 to $129. All these products are forecasted to boost AirPods' revenues by 20% in 2022[60].

According to a recent study by Creative Strategies and Experian, 98% of AirPods users are "very satisfied" or "satisfied" with their device, which constitutes the highest overall level of an

Apple product[61]. Some of the features highlighted by users were quick charging and long battery life aligned with the seamless Bluetooth paring. Some exciting news may be arriving by 2022. The second generation of AirPods Pro is at sight and rumors predict a no stems gadget with updated motion sensors to focus on fitness tracking.

Services

Apple's services are not the major focus of this case study. On one hand, it would be extensive to analyze every single industry linked to each service. On the other hand, the reader would lose the focal point being addressed. Even so, some attention must be devoted to the services category. It is a core piece of Apple when it comes to its success and revenues. Withal in the second quarter of 2021 that section constituted a more meaningful contribution to revenues than the Mac, iPad and wearables and home accessories (see Exhibit 30). Hence, a brief highlight of Apple's services follows this paragraph, working as this theme's introduction to the reader.

Apple Pay

Apple Pay was Apple's approach to enter the mobile payments market. This tool grants consumers the option to save cards in their phones and with a simple double tap on the main button, the card is ready to be used. It consequently enables a cashless transaction with a near-field communication technology. Once again, Apple spiced up its strategic moves when it joined forces with Goldman Sachs. It got the company the possibility not only to possess a physical card, but also to have a greater portion of locations accepting Apple Pay[62]. The number of Apple Pay users worldwide has been increasing throughout the years and it already captured more than 50% of the global iPhone user base.

iTunes, Apple Music and the AppStore

The music industry has always been an attractive market due to its dimensions. Nowadays, the ownership of music via downloads is rapidly declining and streaming by subscription services is flourishing. The iTunes radio (2013) had very little traction and ended up backsliding. Nevertheless, Apple found its place in the music industry by acquiring Beats by Dr. Dre. This allowed the firm to be a high-level competitor for Spotify, under the name Apple Music.

This service is a fearless challenger, having positioned itself above Spotify in paid subscriptions in 2020. Even so, Apple Music located just behind Spotify when analyzing market shares, 25% and 30% accordingly. Other players like Amazon or YouTube, accounted a 12% and 9% share, respectively (see Exhibit 31).

Launched in July 2008, the AppStore was another key factor to Apple's triumph as a company, since from the beginning it quickly gained traction. So far, the company accounts for almost 5 million apps which keep exponentially growing. Apple holds an average price of $0.8 per app (see Exhibit 32).

Apple TV+

Apple is also an entertainment content streamer. It competes directly with the titans Netflix, HBO, Amazon Prime Video, Hulu, and Disney +. The subscription-based model is tagged as AppleTV+ and the public can secure it at a price of $4.99/month. By the end of 2020, Apple retained a 3% market share, as opposed to Netflix's 31% or Prime's 22%[63]. Even so, the number of AppleTV+ users is rising in a market with strong pre-existing positioning. Once again, it contributes to evidence the ecosystem's strength.

iCloud

One of Apple's big stars regarding its services lies in the company's DNA: the iCloud. It is a free service up to 5 GB. Afterwards, there are three subscription plans paid monthly with increasing storage, according to price. Envisioned by Steve Jobs as a flow of information between devices and a storage cloud, the iCloud has already evolved to work between all Apple devices. It even has the possibility of supporting information access of a computer in an iPhone. In fact, a study conducted in the US in 2018 (see Exhibit 33), revealed that most of the respondents valued using iCloud as opposed to Google Drive or other competitors because of its easy accessibility, security, and compatibility.

Challenges Ahead

As a trillion-dollar company, Apple is enclosed in the prosaic world in a way that not many companies have the privilege to. Even so, that does not exonerate the company of the external and internal challenges that any business usually faces.

As stated before, Apple relies heavily on the iPhone to be its primary source of revenues and key differentiator. This comes as a surprise to no one, but can it be sustainable to rely on it on the long run? On one hand, Apple maintains its duty to respond to the perpetual exercise of keeping innovation going. In this case, the iPhone must go through changes that the customer perceives add value to the growing ecosystem. Otherwise, where is the need created in the consumer to buy the most recent launched model, versus the one it holds right now? On the other hand, competition who always fed Apple to have leading-edge products, is now intensifying. Consequently, a substantial number of competitors is starting to be able to have lower-priced products with similar features to the iPhone. Moreover, Apple's rivals are now incorporating characteristics that are not available on the iPhone just yet, giving them a substantial advantage.

On this matter, a second question upsurges: Is now the time for Apple to stop relying on the iPhone? Disruptive innovations are essential in all fronts, that is a fact. But fearless competition is also present in all fronts. However, services lead the second biggest chunk of Apple's revenues and might be a good opportunity to expand the "safe products" base revenues support into. The iPhone is not as reliable as it once was and start looking for solutions to a problem that is not that far away, is crucial to the success of the company. Rapid shocking innovation may be the way to go since it is part of the Apple's heart and trademark. Even so, the need of reviewing the company's business model and strategic management insurges.

Apple positions itself as a premium brand who aims for the best features and products in the market. In fact, that was from the begging its value proposition. However, Jobs was the personality of Apple and helped support this idea like no other. As for now, Tim Cook is taking the lead and a new question arises: Cook is a great engineer, but can he appeal to the imagination of others like Jobs did? The brand perception may be changing around consumers and the market, and that may be fatal to the business. Now is the time for Apple and Cook itself to look for unraveling moves and changes, allowing to place it at the top again.

Apple is also facing a problem in the Chinese market, as it is not being able to retain as much market share in that country relatively to other big markets on the smartphone industry. This poses a threat, since if Apple is to rely so much on the iPhone as they currently do, they should be at the forefront of every major market. The high number of Chinese competitors in that market, alongside with the industry's shape that favors those same competitors, is a challenge Apple was not yet able to overcome. Additionally, Apple's premium branding and elevated prices in the market are not as appealing in the eastern country as they are in other regions. Due to this, Apple is not able to gain an advantage based on their brand perception.

Apple recently introduced its very own M1 chips, microprocessors that will allow to increase differentiation. Moreover, it does act like a tool that allows them to not depend on Intel.

Controlling its own core technologies, allows Apple to integrate its products more deeply, while granting the possibility to shape it in detail to its products. On this matter, Apple needs to be aware of the rising competition for chips, since this instrument is suffering a global shortage that is already affecting the automobile industry. In fact, the inability of chips supply to meet demand is becoming a worrying scenario, because the direct consequence of decreasing chip numbers is the natural increase on their price, putting the companies into a fragile position. However, TSMC, Apple's supplier of A-series and silicon chips for its variety of products has already announced a billion-dollar investment over the next three years to expand production capacity, which is in a way settling. Even so, Apple needs to be aware and prepare itself strategically for any surprises that may come in this sense.

Even though it does not entail one of the central issues Apple is facing, the Covid-19 pandemic should be referred. It showed how an unprecedented situation of such magnitude can affect some aspects that were always thought as being robust. Apple suffered from an enormous turmoil at the manufacturing, supply, and logistical services level, resulting in temporary products' supply shortage. Without a doubt, sales and consequently revenues were damaged, especially on the star product of the company, the iPhone. Even though at the present time things appear to be stabilized for the company, the pandemic's full impact will only be well-known in the longer run, creating the need for Apple to be in "alert-mode".

Case Analysis

In this section, a literature review is presented on topics that are particularly important to analyze the strategic challenges faced by Apple. More specifically, the concepts of competitive advantage, unique resources, privilege market position and disruptive innovations were revisited. Posteriorly, those concepts were applied to an analysis based on the information provided in the case study. It was examined whether Apple has a sustainable strategy to remain

relevant in the industries in which it operates, especially in the smartphone industry. Subsequently, the sustainability of the products faced to the market and the consumer's brand perception was studied. An analysis of whether disruptive innovation is the solution to Apple's problems or not is also included. The case analysis finishes by briefly presenting the relevant points retrieved from said analysis and its conclusions.

Literature Review

Sustainability of Competitive Advantage

Competition is at the core of a firm's will to reach a superior performance within the industry where it established itself. Hence, attributes that differentiate a business amongst competition, called competitive advantages, are key to outperform competitors. Following Costa, Cool and Dierickx (2002), a firm has a competitive advantage when "it creates more economic value than competitors, where economic value created is the difference between the perceived benefits derived by customers from the consumption of the firm's product and the firm's cost of production". Moreover, competitive advantage can be linked with superior value creation (Peteraf and Barney 2003).

Competitive advantage can be attained either through lowering production costs or per adding perceived value by consumers to a certain attribute. According to Porter (1985), neither point is sufficient by itself to sustain a competitive advantage, and both matters in question are dynamic. Furthermore, Porter encapsulates this in the idea that a "competitive advantage grows fundamentally out of the value a firm is able to create for its buyers that exceeds the firm's cost of creating it". Hence, under cost leadership a firm is the low-price manufacturer in the industry, using varied sources of cost advantage. Contrastingly, in differentiation "a firm seeks to be unique in its industry along some dimensions that are widely valued by buyers" (Porter 1985).

Having in account these concepts, Barney (1991) took a step further and defined sustained competitive advantage (SCA) as a "value creating strategy that is not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy". In abridgement, in a highly dynamic and fast-changing world, the value creating of a firm depends not only on its ability to create a competitive advantage, but also on the sustainability of its competitive position. That sustainability can be reached through the deployment of unique resources or from a privileged market position (Barney 1986).

Isolating Mechanisms

Unique resources and privileged market positions are isolating mechanisms, or barriers to imitation. According to Mahoney and Pandian (1992) they are economic forces that have the power to limit the imitation or duplication of a firm´s competitive advantage. Ultimately, it allows to explain why there are striking differences between companies within the same industry. These isolating mechanisms allow an individual firm to be protected when competing against other players, as these competitors were excluded from being able to have these sources of sustained competitive advantage. By having such resources or market position, a firm denies or highly difficults the access of others to a SCA. Besanko and Braeutigam (2013) divide these entry barriers in structural, legal, or strategic segments.

Structural barriers to entry exist when a firm has cost, marketing, or demand advantages over the other players, precisely like in economies of scale. The unit cost of production tends to decrease as the production's volume increases, due to the dilution of fixed costs and increasing bargaining power. A new competitor would need to incur in high upfront costs not to be in a situation of cost disadvantage (Besanko and Braeutigam 2013); (Porter 1980). Besanko and Braeutigam (2013) also highlight network externalities that happen when a product becomes

more attractive to the consumers the more it is used, as a structural barrier. In some products when the number of users reaches the level of critical mass, it becomes very unattractive to new competitors to enter in that market.

Under Dierickx and Cool (1989) vision, legal barriers act by protecting the incumbent company from the competition in a legal basis. Patents, copyrights, or trademarks fit in the description of this specific isolating mechanism. This type of unique resources or privileged position held by a company show that a firm cannot expect to purchase sources of sustained competitive advantage on the free market (Besanko and Braeutigam 2013). Ultimately, a company can also isolate itself from competition and assure a SCA by strategically acting to block competitors, making the industry unattractive to new players.

Hence, isolating mechanisms are entry barriers at the company level that discourage rival firms to compete for the extra profit a company generates through its competitive advantage. Besanko et al. (1996) define two main isolating mechanisms: impediments to imitation and early-mover advantages. Impediments to imitation are linked to unique resources and impede other new competitors from duplicating resources and capabilities that make up for the basis of a firm's advantage. Contrastingly, early-mover advantages are associated with privileged market positions and allow for an economic power increase over time.

The authors present a framework in which it becomes clear how a firm reacts under the different isolating mechanisms (see Exhibit 35). Besanko et. al (1996) argue that the shock that allows for a firm to be in a position of competitive advantage can originate from different scenarios. On this matter, product innovations, shifts in demand, changes in regulatory processes or the discovery of new sources of consumer value or market segments, are highlighted as examples. Whilst impediments to imitation prevent competitors from being able to fully replicate a firm's competitive advantage, early-mover advantages widen the competitive advantage over other firms in the market (Besanko et. al 1996). In fact, in industries where these shocks are not so

common, a firm is able to hold to a competitive advantage for longer lasting periods, since isolating mechanisms gain more relevance.

Unique Resources

As explicitly organized by several authors Barney (1986), Dierickx and Cool (1989), and Wernerfelt (1984), the resource-based view defends that a company can reach a SCA through firm-specific resources. In this analysis we consider resources and capabilities as two concepts that can be grouped together. Capabilities are the set of activities and routines that a company performs to deploy the resources it owns (Markides and Williamson 1996). Resources are defined as being the set of organizational assets or attributes (tangible or intangible) that are tied to a firm, and which can be identified as strengths that can be used to deploy its strategy (Porter 1981); (Wernerfelt 1984). Hence, as both these concepts are a source of sustained competitive advantage and are directly related to each other, we will group them.

Resources can be distinguished between tangible and intangible. Ketchen and Short (2013) define tangible resources as the ones that can be "readily seen, touched, and quantified, like cash". In fact, money is valuable, but rivals can acquire it easily. Antithetically, the authors designate non-tangible resources as "difficult to see, touch, or quantify, such as the knowledge and skills of employees, a firm's reputation, and a firm's culture". Usually, these intangible resources are the ones who meet the principles of a good strategic resource. For a resource to have the potential to be a source of SCA, the resource-based view defends that it must have four attributes: value, rarity, imperfectly imitability and non-substitutability (Barney 1991). Hence, when a company's aim is to master a SCA, it should logically nurture this type of resources. In abridgement, all these characteristics can be thought as attributes that show how heterogeneous, imperfectly mobile, and imperfectly imitable firm-specific resources are (Costa, Cool and Dierickx 2002).

Barney (1991) presents value assessment as distinguishing if a resource raises the perceived customer value level, consequently allowing a firm to deploy effective and efficient strategies. Yet, if a resource is possessed by many competitors, it will be discarded as a resource capable of delivering SCA. Indeed, it is mandatory that resources are rare and can be acquired by few companies. An important observation is that resources held by most companies are still relevant and important. In fact, these resources can maintain some firms out of closure by applying what the other players are doing. However, it does not represent a source of competitive advantage that is sustained (Barney 1989); (Porter 1980).

Barney (1986) highlighted that a resource is defined as inimitable or imperfectly imitable if it is hard to duplicate or if the company has exclusive access to it. Consequently, valuable, and rare resources are only a source of sustainable competitive advantage if other firms cannot obtain them (Dierickx and Cool 1989). Even so, there must not exist other valuable resources that are strategically equivalent. That would mean different resources could be deployed independently from each other and still be capable of generating same or equivalent strategies (Barney 1991). Only if all the resources' characteristics stated above are verified – heterogenous, imperfectly mobile and imperfectly imitable – are they able to sustain a competitive advantage (Costa, Cool and Dierickx 2002).

Privileged Market Position

As previously stated, apart from unique resources a company can reach SCA by benefiting from a privileged market position. The resource-based view assumes that "it is possible to define the conditions under which resources lead to superior performance without explicitly considering the competitive implications of resource deployment in product markets" (Costa, Cool and Dierickx 2002).

When competitive advantage derives from industry structure instead of unique resources, it must be attributed to privileged market positions. Privileged market position is a source of competitive advantage in the sense that its "adroit implementation by a limited number of firms makes its replication unprofitable for latecomers" (Caves 1984). Hence, it is not specifically the fact that competitors cannot replicate a position, but the fact that they do not have the incentive to. Economies of scale are an example of this competitive advantage in the sense that they "force small firms to increase their scale of production or to increase product variety in order to achieve unit cost parity with the dominant firms" (Cool, Costa and Dierickx 2006). Moreover, Spence (1979), Eaton and Lipsey (1981) and Lee and Wilde (1980) describe production capacity's expansion, investments on intangible property and usage of brand proliferation as situations where a privileged market position is created.

If a position of complete cost advantage is reached by a firm by investing in the reduction of production costs, that will lead to a commanding position within the market. In fact, Cool, Costa and Dierickx (2006) argue that "large investments in production capacity ahead of growth of market demand may allow a large firm to credibly commit to compete aggressively if entry occurs or if a small competitor expands capacity". In abridgement, this strategic move may lead new competitors to perceive the market profitability as low, which will ultimately cause them to abstain from identical expenditures.

According to the previously stated authors, network externalities are present "when the benefit a consumer derives from the use of a product increases with the number of other consumers purchasing compatible items" (Cool, Costa and Dierickx 2006). This too can constitute a privileged market position since on these environments a firm with an enlarged customer base will logically have a strategic advantage over firms which hold a small base of consumers. Smaller firms will be in an even greater disadvantage if economies of scale are considered. The

fact that larger companies' investments are linked to nonrecoverable costs in this scenario, may lead firms to react aggressively to potential moves from threats (competitors).

Earlier brand proliferation was identified as an action able to sustain a privileged market position. According to Cool, Costa and Dierickx (2006) the proliferation of product varieties is linked to the choice to "produce several products that are differentiated according to brand, product-specific characteristics or location". In fact, if a prominent firm crowds a product space in the market that will likely lead to an increased market share at the cost of competitors that would be better off with specialization (Gilbert and Matutes 1993). Hence, by isolating specific product spaces a privileged market position is created in the sense that other firms are left with less opportunities to establish themselves on the market.

Disruptive Strategies for Value Creation

Watching leading companies fail when technology or markets change is not new. Usually, companies concentrate in current customer's needs while developing new technologies. However, characteristics valued by consumers evolve in such a fast pace that eventually can be dominated by the pioneers of new technology (Bower and Christensen 1995).

The term disruptive innovation does not refer to an event which happened in a certain moment, but rather to the evolution process of a product or a service over time. Usually, disruptive innovations seem financially unattractive to established companies, since there is often a higher cost structure installed to serve sustaining technologies. Hence, companies may choose to go down-market, in low-end innovations, a concept linked to accepting lower profit margins related with disruptive technologies; Or contrastingly to go upmarket, with new market innovations, which means to enter market segments with attractive profit margins, using already existing technologies (Bower and Christensen 1995); (Christensen 1997). Regarding the second

alternative, Christensen (1997) points out that many incumbents fail because they do not revise and adjust their previous managerial approach.

Markides (2006) pointed that focusing on disruptive technologies to explain all kinds of disruptive innovations could be misleading. That was sustained by the fact that different disruptive innovations have competitive effects that can generate different kinds of markets. Hence, two other categories belong to the concept of disruptive innovation: disruptive radical product innovation and disruptive business-model innovation (Markides 2006). Radical product innovations present a new concept for both consumers and producers. According to Markides and Geroski (2005), established companies usually do not have incentives to attempt to create such products. Instead of spending resources, they should aim at developing networks of small companies who in turn, do try to come up with disruptive product innovations. Business-model innovation entails the formulation of a distinct business model in an already existing business, by attracting new customers unusually targeted by companies, or by encouraging more consumption on existing customers (Markides 2006).

Twenty years after, the disruptive innovation theory developed by Christensen in 1995 was revisited by the author himself alongside other academics to further explain it. According to the authors, disruption describes a "process in a smaller company with fewer resources that can successfully challenge established incumbent businesses" (Christensen et al. 2018). When customers start adopting the entrants' offerings at large scale, disruption occurs. Christensen, Raynor and McDonald (2013) further explored relevant points to the theory that are usually misunderstood or overlooked. Since disruption is a process that takes time, incumbents frequently overlook disrupters. Disrupters often create business models different from those of incumbents, contributing to the rising resistance to it. In addition, the mantra "disrupt or be disrupted" can be misleading. Incumbents should respond to disruption, but without dismounting a profitable business.

When compared to new companies, established ones find it hard to innovate. According to Markides (1998), for established companies, the problem of strategic innovation is organizational. A strong leadership is crucial for the development of a culture that questions current success. According to the author, it is the approach a company must follow in order to succeed in the long term. James Burns (1978) identifies two types of leadership in his book, transactional and transformational. Transactional leadership happens when the leader approaches the follower for the purpose of an exchange where the follower complies to the leader and is rewarded in return. On the other hand, transformational leadership involves more than just compliance. It revokes around shifting the beliefs and the values of the followers. According to Burns (1978), "the result of transformational leadership is a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents". This idea was further developed by Bass (1985), by entitling transformational performance as a superior leadership performance. By elevating the interests of their followers and generating purpose for the group beyond their individual self-interest, transformational leaders can achieve great results. Moreover, expressing personal charisma can unite their followers while also changing their goals and beliefs. This leadership approach results in a considerably higher level of performance amongst individuals than the transactional leadership (Bass 1985).

For companies to keep being innovative, gathering and interpreting information regarding market trends and changes is crucial to create a firm's adequate response. The ability to take such actions correspond to firm's market sensing capabilities. Day (1994) defines a market sensing capability as a knowledge-related capability of monitoring consumers, competitors and the market context in which a firm is inserted in, in order to respond properly to market changes. In fact, market sensing capabilities are essential to sustain a firm's SCA by allowing to readily identify opportunities and threats and promptly respond to them (Eckhardt and Shane 2003).

Moreover, Danneels (2008) argues that sensing capabilities are key to explore different markets and build customers relationships since exposing "the firm to events and trends in domains distant from its current activities yield information about opportunities within those domains and will thus support exploration".

Industry Analysis

Apple operates in several industries, as shown in the case study. However, to further explore its sustainable competitive advantage and disruptive innovation concerns, the focus will be centered on the smartphone industry. The reasoning behind this, is that the Apple company relies mostly on its smartphone as the major contributor to revenues. Hence, the smartphone industry was reviewed and complemented with a Porter's Five Forces analysis.

Analysis of the Smartphone Industry

The smartphone industry is a monumental industry to which right now corresponds a $378.29 billion evaluation. Moreover, a CAGR of 6.85% is expected until 2026, reflecting the industry's steady growth. Not only this growth trend is continuous but fomented by several factors.

The market need for smartphones is sustained by the applicability regarding the routineer life of the population. This implies that specifications and functionalities expansion, as well as product disruption are required to keep the population interested. Even so, the day-to-day life may also be responsible for constant smartphone sales since it influences the rate at which they are broken and at which the equipment suffers depletion. To complement this, the adoption of 5G technology constitutes a crucial driver to the industry's expansion. The 5G works as a support to the growth and rebound from the Covid-19 pandemic (explained in the case study) by allowing the consumers to have faster internet and connected ecosystems like smart homes. Hence, the stable growth trend is likely to be fortified in the upcoming years.

The population desire to have the most up-to-date technology available in the market also strengthens the constant upgrades made by the population in smartphone models. However, the market is permeated by strong competition, in which few brands capture most of the market share. Hence, each player must look for a different way to stand out and highlight its product if it wants to survive in a sea of titans.

Porter's Five Forces Analysis

To understand the impact of the current industry structure on intensity of competition and attractiveness of the market, a Porter's Five Forces analysis on the smartphone industry was conducted (see Exhibit 34).

The smartphone industry is highly shaped by the need of innovation and differentiation amongst its players. The bargaining power of suppliers is generally low excluding some large players such as Google. Otherwise, small-scale players have conditionate economic strength when compared to the leading brands in the market like Apple, Samsung, and Huawei. Due to this, suppliers must follow the quality standards imposed by these companies, limiting their negotiation position. Moreover, suppliers lack forward integration capability, which undoubtably confirms the suppliers' lower control that has been in discussion.

The bargaining power of buyers, on the other hand, has been increasing. Consumers are well informed and conscious that they have several options in the market due to the high number of substitutes. Consequently, it increases competition in the industry. Even so, other factors contribute to even the scale and make buyers' power moderate. On one side, the switching costs are high since users that get used to smartphone's operating systems and apps, are less likely to switch for different ones because the learning and familiarization process would occur again. On the other hand, product quality and brand image itself create space for products' higher prices since they are an associated trade.

The entry of new competitors in the smartphone industry does not represent a strong threat. In fact, the cost of new manufacturers to entry in the "battlefield" is extremely high. Alongside with this, legal frameworks in most countries act as a barrier since there are difficult product regulatory, consumer protection, environmental and safety laws. Moreover, incumbent companies are investing massively on marketing and innovation while focusing on consumers' needs, which strengthens even more their brand image. The number of substitutes is high with each segment holding various models. Hence, new entrants are not seduced by this particular industry.

The threat of product substitution has a moderated range. On one side, besides other smartphones producers only tablets can be seen has replacements since they have a similar interface, apps, and functionalities. Tablets concentrate on computing and entertainment and can come to incorporate communication support. Even so, they have larger screens as opposed to smartphones and do not account for all the main objectives of the smartphone, like practicality. On the other hand, differentiation has increasingly become more difficult with most smartphone models holding similar features. That creates an opportunity for emerging competing products, even if they initially do not hold the same product quality and brand image as its competitors.

The competitive rivalry in the smartphone industry is high due to multiple factors. In abridgment, the demand plateau increased the focus of established producers, in innovation, and customer retention. In fact, companies have been massively investing on R&D, with Apple, Samsung and Huawei standing out. Possibly due to this, consumers tend to have high brand loyalty, which generates an even bigger competition climate: a producer who conquers a client is likely to stay with it. Even so, there is a constant need for companies to be disruptive and hold the "next greatest device", which puts rivalry at its highest. All producers target the same

overall customer groups and geographic area. Thus, even with small changes in prices, who now holds a great advantage is whoever conquers disruptiveness first.

Companies integrated on the smartphone industry need be aware that consumers are starting to make more knowledge-oriented decisions. As brand loyalty plays an important role in this market, a company that conquers a well-informed customer right now, is likely to hold to it. However, rivalry is high and the need for differentiated products has been increasing. Even so, this contrasts with the increasingly difficulty on being disruptive. Thus, a firm who strikes a state-of-the-art innovation in the market, will hold an advantage against its competitors.

Company Analysis

When a company operates in a dynamic environment among an intense rivalry industry, the firm must develop certain strategies and accumulate unique resources that secure a competitive advantage. In Apple's case, expressly regarding the iPhone, it is extremely relevant to assess its competitive advantage as the company relies highly on this product's revenues. As stated before, Porter defends that there are two ways to outperform the competition and have competitive advantage over them. With the reduction of the total costs a product has, giving the company an advantage over its competitors by applying a cost leadership strategy. Or, by delivering products that have higher perceived value by the consumers, including differentiating unique characteristics, resorting to a differentiation strategy.

Why Apple Does Not Hold a Cost Leadership Strategy

Under cost leadership a company becomes the lower-cost manufacturer in the industry, ideally without sacrificing quality while generating more profit. In order to cut costs and have control over the product quality, Apple sets a profound vertically integrated value chain. This should be perceived as an ecosystem of suppliers, developers, and retailers. Apple has full control over

the hardware manufacturing, even owning some chip manufacturers, and develops its own software such as iOS and macOS, optimizing it specifically for the company's hardware.

Moreover, the firm runs web services like the App Store, Apple Music, iTunes, or the iCloud. On the back of Apple devices, an inscription reads – "Designed by Apple in California. Assembled in China". This is the result of most vendors the company relies on being concentrated in the low-cost Southeast Asia, which as previously mentioned, allows Apple to reduce costs.

Even so, Apple is focused on premium products, targeting the high-end segment of the market, with the counterpart of higher prices. Even if considering only the premium segment, the Samsung Galaxy S21+ and the iPhone 13 Pro are sold from $999, but Apple's device is more expensive to manufacture. Hence, it becomes clear that Apple cannot apply an effective cost leadership strategy. Moreover, events like the chipset shortage verified since the strike of the Covid-19 pandemic have been contributing to rising iPhone component's costs.

Apple's Differentiation Strategy

Apple has chosen to pursue a differentiation strategy with the iPhone, even though it might not be so discernible. In the smartphone community there are many customers who criticize Apple for delivering the iPhone at such premium prices without an apparent reason. However, at the other side of the spectrum, many customers defend Apple´s products with extreme loyalty to the brand. Letting aside the emotional component for a moment, what are the features that differentiate the iPhone from other competitors that justify its price?

When analyzing iPhone's specifications relatively to equivalent devices, the conclusion is that the Apple brand has not been superior. In fact, when comparing the iPhone 13 Pro Max with its main competitor Samsung S21 Ultra, it becomes evident that the iPhone is inferior regarding product specifications. From the technical information of the best smartphones of the two

leading companies, Samsung offers a more pixelized screen that enables better images to be displayed. Camera quality is also greater at every relevant aspect for the average user and the bigger battery makes the Samsung S21 Ultra more advanced than the iPhone. Over the last years, this has been the case for iPhone products. They have been constantly featuring worse specifications for an equivalent price. It seems justifiable that specification driven consumers have a propensity to think that the iPhone is a product that doesn´t differentiate enough from other brands. However, with such a particular product as the iPhone, one must go deeper to access the degree of differentiation of this brand.

One of the biggest differentiators of the iPhone lies in its software architecture, the iOS. In contrast, all other smartphone manufacturers competing with Apple develop their hardware and brand specific features on top of the android operating system. Hence, these companies end up being limited by what the Android's architecture system allows them to do. Logically, that is why their differentiation driver are product specifications. On the contrary, Apple created the iPhone's operating system, so the integration between hardware, software and user experience is more refined. The operating system is indeed one of the most important components in a smartphone. Hence, the fact that Apple has its own system differentiates the iPhone by selling a different user interface, user experience and different functionalities.

The iOS and the integrated ecosystem that comes with it are the main reasons why the iPhone is such an individualized product. An iPhone user knows that a big advantage of owning this product is the distinct experience that the network enables when compared to other brands. The operating system favors seamless communications between users. The iPhone comes with its own music streaming platform, an exclusive messaging app and the simplest way to send information, Airdrop. These are just a few of the unique features that do not show in any technical specification analysis. Hence, this kind of differentiated resources are the fundamental

logic behind why this smartphone is so popular. Undoubtably, it provides the user an experience that no other existing smartphone on the market can deliver.

As Jay Barney underlines, a resource with certain characteristics can be an important source of sustained competitive advantage. The iOS and its underlining ecosystem are a resource proven to deliver value to the user. Moreover, Apple is the only company with access to it, being its only holder. The firm is also the only one who will ever possess it, as it created a situation in which the resource is protected from competition through legal isolating mechanisms.

Regarding the iOS as a resource and its ensuing ecosystem, it is important to highlight that there is no other strategically equivalent resource on the market. In fact, there is no incentive for an individual company to develop its own operating system and develop a network of users that is big enough to support it in a way it delivers value. None of the companies owning the direct competitors of the iPhone have an incentive to leave the Android operating system and develop their own.

In abridgement, the technical specifications of the iPhone do not differentiate. However, when its operating system and all the connectivity that comes along with it is added to the equation, it becomes evident that the iPhone follows a differentiation strategy to gain competitive advantage.

The iPhone's Competitive Advantage

As previously mentioned, despite Apple's efforts to be cost efficient, from a high vertically integration strategy to a low-cost approach, the company cannot be considered cost leader among the industry. Even so, Apple's seamless user experience, due to the its own software (iOS) and perfect allignment with the hardware, entail a differentation strategy. Moreover, Apple's peerless ecosystem is also part of the company's success, providing a distinguished

user experience. With the stated unique resources, Apple assuredly has a competitive advantage over the competition.

The Apple Brand

A company's brand is a tool for acquiring competitive advantage. It is a non-corporate asset for the firm as it adds value and differentiates it from the others. Thanks to the strategy built upon the brand, companies like Apple are able to emotionally connect with their customers. Hence, they acquire a competitive advantage. Brand loyalty represents an important component of this value. Through this, Apple can orient buyers' preferences towards their products, by the exploitation of emotional ties. In addition, one other kind of loyalty can be explored. Inertial loyalty is conquered through a repetitive and satisfactory acquisition of brand's products, without the existence of emotional ties. The main problem of this loyalty is that it is very fragile, meaning the buyer does not face high switching costs and therefore finds it easy to change between suppliers.

Apple's brand is one of their most valuable resources, facing a very high popularity and consolidated position in the market. The key is Apple's image of a foreseeing company, who reaches for greater technological innovation and product quality. However, in recent years the company has been feeding of the brand image it developed, and not actually contributing to build upon it. Despite being recognized as the epitome of a cult brand, it still faces the risk that customer's brand perception will change. In the following paragraphs, the two main reasons contributing to the changes in Apple's brand perception will be analyzed.

Apple leadership changes have had a major impact on how the brand is perceived by customers. Steve Jobs is, and will always be, the face of Apple. His approach towards product innovation marked Apple for good, enabling it to establish itself as one of the most important technology companies in the world. Jobs believed in creating the next revolutionizing technological product

and was willing to take risks to do so. Tim Cook on the other hand, has a gentler approach. His focus goes towards developing incremental innovations for Apple's products, in the sense of keeping the company safe.

Despite the undeniable differences in personality traits, the different maturity stages of the company also explain the different approaches taken by both CEOs. Steve Jobs returned when Apple was at the brink of death and in need of an aggressive approach. Contrastingly, Cook took charge of a consolidated company, which required a different managerial approach. The more democratic and sustainable managerial method taken by Cook lead Apple to be a more stable and gentle company regarding innovation. Although this looks more adequate for a company in Apple's current stage, it differs a lot from the original impression customers were used to. As such, under Tim Cook's leadership Apple seems to be losing the differentiation factor it originally built. Notwithstanding, the same would likely occur were Steve Jobs still the CEO of Apple, as a consequence of the maturity of the company.

Considering the facts, a combination of both approaches would be idealistic for two very distinct reasons. On one hand, under Tim Cook's supervision Apple could continue to develop a healthy and constant growth of the brand, expanding its devices and services ecosystem while further develop their products through incremental innovations. On the other hand, Jobs thrive towards achieving greatness would consolidate Apple´s brand as an innovation leader, attracting and stealing customers from competitors. Even so, with the great success of the iPhone, Apple got protective and is not as eager to try anything new as it once was. As a consequence, it might be letting their customers down. In effect, the AirPods were the last really innovative product the company has launched.

When deeply analyzing the company, one must highlight the small moves it has been doing into new industries. What seems to be Apple's new strategy is to focus less on what used to be its core product and to be disruptive in a few years in new industries. In substance, Apple is not

introducing revolutionary innovations in their core because they changed their focus to setting foot in different industries, which in a way reflects the recommended approach to disruptive innovation for established companies. Healthcare, retail and media are the industries that stand out the most. Nonetheless, this is still a great challenge for Apple. The allocation of resources to thrive with these new projects will be very difficult, especially when their current value is entirely tied up with one product line and related businesses. In fact, Apple's financial situation reflects that the iPhone is their number one source of revenues. Additionally, these are innovations that are not likely to be disruptive soon. Therefore, they probably will not attract the attention of customers who so impatiently wait for Apple's next big product.

Despite the two above-described factors, Apple is still able to derive a competitive advantage through emotional customer loyalty. The social impact of being an Apple's client has allowed the company to retain a big proportion of their clients. For such clients, the innovations connected to the products are only marginal. Nonetheless, their lack of disruptive innovations leads to the loss of a portion of the clients. Even so, customers who were inertially connected to the company focus more on the products' practicality. Thus, they will not hesitate to buy them from competitors.

The longevity and sustainability question of Apple's brand strategy arises. Even the loyal customers will, at some point, realize that Apple is lagging behind competition. What is of extreme relevance for Apple is to be able to satisfy their customers until the day a disruptive product is released. Such day cannot be too ahead in the future. Otherwise, it might be too late for Apple to depend on customer loyalty to re-gain the customer basis they once had.

Apple's Concerns in China

As previously stated, alongside with the United States, China is the leader region in the smartphone industry. Even so, in contrast to the western country, Apple is not the market leader

in that sector. Because Apple's sustainability is dependent on the iPhone, this is a matter of concern for the company. The firm's struggle to consolidate their position in the fastest growing market in the world can represent a threat to the company's sustainability. This poor performance might be explained by two factors. On one hand, China has their own smartphone producers such as Huawei and Xiaomi, which alongside with some political restrictions, pushes Apple away from the consumer's interests. On the other hand, the iPhone's luxury positioning is not as appealing in China as it is in other regions.

Interestingly enough, a crucial problem that Apple faces in China is one of the reasons it strives in the United States - the iOS. In contrast to the company's home country, their software is not as appealing for the Chinese consumer, as most of the smartphone usage revolves around their own operating system, WeChat. Despite presenting itself as an app, WeChat allows the user to do a whole range of different activities all in one single location. Moreover, because it is subsidized by the Chinese government, it became forbidden to resort to other apps such as WhatsApp, Google, or YouTube. The problem in fact, is that WeChat runs equally well in both iOS and Android, and so the Chinese consumer has no actual incentive to opt for the iPhone. In abridgement, Chinese smartphone providers can meet the needs of consumers at a lower price while exploiting profit maximization due to their huge demand. Apple, on the other hand, cannot.

The iPhone's low popularity amongst the Chinese customers can also probably derive from the willingness to spend money on non-primary consumer goods. As they are a premium product brand which offers a unique line of smartphones, they paint a huge contrast to Chinese manufacturers that release a much broader range of devices at very different price points. In fact, in China manufacturers cover the majority of the consumer segments in the market and consequently retain a large market share.

Disruptive Innovation

Disruptive innovations introduce a hugely different set of attributes from the ones current customers historically value. A firm can introduce disruptive innovations or not, depending on its internal organization and on how it interacts with the external environment. For many years, Apple has been a good example of a company that revolutionized the market by introducing several disruptive products. However, since 2011 the level of disruptiveness seems to be decreasing and the company is relying more and more on the iPhone. For how long this situation will be sustainable is not clear, but some points of concern can be considered. In the following section four probable causes will be explored.

Sensing Capabilities

Steve Jobs excelled in recognizing market requirements and strategies and, when he detached from the role of Apple's CEO, the company struggled to maintain their sensing capabilities. Their reliance on one man's attributes, may be one reason behind Apple's lack of disruptiveness. In fact, sensing capabilities are the capacity of assessing the opportunities and consumer needs that exist outside of the organization. Moreover, they depend on previously acquired knowledge and on managers that must have the ability to recognize potential in new opportunities. What is unique in Apple's case is that those capabilities were not simply partially provided by Steve Jobs, but were somehow dependent on him. As possessing sensing dynamic capabilities is necessary to gain a sustainable competitive advantage, losing them might bring some problematic situations. In fact, if a company does not have the capacity to understand the market and anticipate its competitors, it is impossible to introduce revolutionary products. And this seems to be Apple's current situation.

Throughout his leadership, Steve Jobs was able to foresee and define trends. He created products that were disruptive for the already existing markets, but amusingly he was even

creating new markets. Certainly, back then it was already clear that a substantial portion of Apple's success and ability to innovate was due to its CEO's qualities. Indeed, there has always been several minds behind the introduction of new Apple products, but Steve Jobs was the coordinating piece to reach disruptiveness and competitive advantage. As already mentioned, since the death of Steve Jobs Apple has only launched one revolutionary product: the AirPods. As for the rest, the company has just been introducing incremental innovations to their products. Possibly the market is not presenting any interesting and valuable opportunity for Apple since 2016, but this seems unlikely. This becomes tangible when combining the fact that not only Apple is not introducing disruptive innovations but it is always one step behind its competitors. Firms can always develop sensing capabilities, but it is a process that requires time. By appointing the right people and putting a lot of effort into studying past and present market situations, Apple could once again gain the knowledge of how to react in face of certain opportunities and threats. Surely, the company's management has already started with this process and some small results can be seen in the incremental innovations that it is introducing. Unfortunately, as already mentioned, it is a long process and will require a lot of effort, especially for a company that was used to rely on one man's extraordinary sensitivity to market changes.

Attitude Towards Risk

The perception of risk by Steve Jobs was likely one of the main boosters to where Apple stands today. When the outcome of Jobs' risk approach held the potential to achieve greatness, he could not be particularly described as risk averse. Tim Cook, on the other hand, tends to see goals as opportunities to maintain the *status quo* and keep the business running smoothly. The cultural elements that fostered innovation at Apple, such as risk taking, were replaced by corporate conservatism. When faced with an opportunity to come up with an innovative

product, Steve Job's Apple and Tim Cook's Apple would answer differently. One reasonable explanation would be the previously mentioned sensing capabilities that were "owned" by Jobs. Another major reason could be that, in fact, Apple's attitude towards risk has changed. Or even more, the CEO's themselves have different profile risks.

Notwithstanding, Apple has not stopped taking risks. Instead, Cook embraces a philosophy of taking calculated risks. When comparing the two cases, Cook spends more in R&D, even as a percentage of sales, than Jobs in his later years. Apple's current CEO knows that many of the innovative ideas will result in failure. Nonetheless, he will still give it a try. A company the size of Apple can absorb most of the failures resulting from small changes without damaging their performance too badly due to its stable financial performance over the last years. Hence, Cook and his team have a privileged position, as they can explore new consumer technologies and designs without suffering from internal pressure. Externally, it has already been proven that Apple does suffer from pressure to be innovative (see The Apple Brand section). Cook practices a managerial style of work repartition. As mentioned, he is a very democratic manager and surrounds himself with competent executives. By doing so, he does not need to micromanage every department and de-centralizes the disruptiveness role from one man alone. In other words, Cook can be described as a transformational manager, fulfilling the role of a leader that cooperates with its employees and impulses them to achieve the best performance outcome possible. Jobs on the other hand, was more related with a transactional leader. Despite his individual geniality, his relationship with its followers was, most of the times, an exchange of interest to reach a common goal.

Apple's current CEO is consequently more prevention-focused, whilst the former CEO was more promotion-focused. The first one is motivated by avoiding loss, emphasizing on obligations, responsibilities and a preference for avoidant strategies. The second one was motivated by the achievement of gains, with emphasis on aspiration, ideals and a preference for

a more eager strategy. In theory, the alignment of a person's focus and the means for pursuing a goal will increase the perceived value of an activity. In other words, there is no correct way of doing things, as different approaches can lead to the same value creation by different means. Despite Jobs and Cook's different takes on risk, both were and are able to create value for Apple.

In sum, Apple has indeed been through a transition of how the company perceives risk. Nonetheless, it still takes risks. This is possible as it has built a healthy margin for errors and as it is not so dependent on the success of its investigation for new products. Even so, the risks that Apple are facing are not of disruptive characteristics. Despite the larger R&D investment, the company still does not seem to compromise with a revolutionary product's release. Tim Cook can possibly either be restricted to organizational inertia, and therefore not recognize the positive risks of disrupting the market or not have the capacity to do so.

Apple Matured in its Business Cycle

When analyzing the disruptiveness of Apple in the last years its maturity stage evolution also plays a significant role. Companies go through distinct phases of development and their respective business life cycle affects the way they behave and face risks and innovation. When Steve Jobs was running Apple, he did not reach the maturity stage of the company even if it was already valuable enough to be one of the most recognized companies in the world. Apple's DNA changed when Tim Cook joined the company as CEO and the risks of failure became larger. When Apple was a start-up or a growing company with a lower valuation, its degree of disruptiveness was much higher, and the innovation was a constant variable. On that stage, the company was more dynamic. Its human capital structure was not so rigid, and the overall environment stimulated innovative ideas and creativity. Now, Apple is in a more matured stage

(despite the fact that it is still growing), operations are stable and more predictable, and the company is focusing on sustainability rather than taking large risks.

What Apple is doing is what most matured companies do: not taking a disruptive approach that could reinvent the status quo of the market. Apple is still innovative but it is focusing on small and constant incremental innovations that offer confidence to investors and create constant growth. As a mature company, Apple´s strategy is focused on the mainstream customers that constitute the largest market segment and potentiate a better company performance.

Most innovations and disruptions require heavy R&D investments. Apple prefers to buy from the market some of these innovations. For example, Intel develops chips for Apple, Beats by Dre is developing innovative technology for its music segment and Samsung supplies internal hardware components. Hence, Apple is outsourcing from the best in each division to maintain the iPhone innovative while moderating its risks and R&D investments. Consequently, the firm assigns all the market screening work and potential failures to other companies or to smaller companies that belong to the same group, with the advantage of a brand not being associated to Apple at first sight, like Beats by Dre.

Incentives for Disruptiveness

Clayton Christensen described the concepts of "disruptive innovation" through which companies, usually start-ups, disrupt established industry leaders and steal market share. This turnaround is possible because the dominant firm is often under competitive or growth pressure to defend its sustaining business model and revenue stream. As companies conquer market recognition and brand loyalty, the main challenge is to meet the expectations of stakeholders, mainly shareholders, also by incrementally growing top-line revenue. And Apple is no exception.

In Apple's early years, the company aimed to delight customers first and only then, benefit other stakeholders. The visionary Steve Jobs was focused in anticipating and exceeding customers' needs and expectations, no matter the cost, which some perceived as against business norms and investors. Shareholders were definitely not a priority, as Jobs did not take short-cuts or actions that would expand shareholder value. Contrastingly, Tim Cook got rid of most of the turbulence in Apple by replacing it with structure. Whereas investors and shareholders benefit from stability and predictability, a heavy focus on optimization systems and profits creates an innovative death spiral. Thus, Apple has incrementally improved its existing devices, with the iPhone in the spotlight. Innovations now lie on the wearables, namely the Apple Watch. Still, the smartwatch performance and customer experience are potentialized if the user has already an iPhone, due to the synergies of the Apple ecosystem.

Apple's shareholders cannot complain of the company's financial performance. Now second to Microsoft, Apple's market capitalization is $2.343 trillion and over 80% of that was massed during the tenure of Tim Cook. Alone, Apple's market capitalization exceeds the GDP of 82% of all countries worldwide. Paradoxically, when Steve Jobs left in 2011, the market capitalization was only $377.51 billion. It is of the utmost importance to remind that from the moment Cook took the lead, the stock price boosted 986%, reaching $142.83. Apple executives are so obsessed with its share price that they set a share buyback program. In other words, the company buys its own shares to boost their price and earnings per share, which obviously pleases shareholders. When successful companies mature, they tend to live for the increasing share price, through a repeatable and scalable business model that generates dividends, revenue and profits. However, in such a dynamic and competitive industry, the tighter they rely on their champion product, the more likely they will need to be disruptive.

Earlier it was mentioned that even responsive companies to their customers' needs are trapped by its own success. In the case of Apple, the company's own success is the iPhone. Even though

Apple is changing by implementing a shift to wearables and services, both categories were built in the foundation of its core product, the iPhone. It is evident that the smartphone market is getting saturated, with little room for innovation. Similarly to firms, industries also go through phases and this is not a decade of blockbuster gadgets for any company. However, Apple is innovative not only for its products, but for the powerful and unique ecosystem it has been building, which is their main source of differentiation over competitors. Staying away from the iPhone, which accounts for 1 billion active owners, would mean to ignore the company's biggest competitive advantage.

Hence, there might be no incentive for Apple to innovate in a risky way. Being always on the spotlight implies that great risks could impact the overall brand image of the firm. The impact of public scrutiny can be found in the episode of Apple's Maps. In 2012 the company tried to develop its own version of the Maps application, aiming to stop being completely dependent on Google. Even so, the first version was a huge failure which had a strong resonance all over the media at the extent that Apple's CEO had to apologize to its customer base and suggest using other map services from competitors. In addition, in Apple' situation, shareholders are not interested in innovation. This tendency is justified by the company's more advanced stage, especially since they have been going through a financially positive period. Furthermore, Apple's biggest competitive advantage is its completely inimitable ecosystem. This ecosystem will never have any other device to occupy its center position in comparison to the iPhone, that is used hourly by its owners, making it difficult to replace this device.

Recommendations and Conclusion

Based on everything that was analyzed, Apple is struggling with some defining issues. Hence, not only a conclusion was derived from the case analysis, but some recommendations were designed to help Apple maintain its business as prosperous as it can be.

Despite presenting a competitive advantage in their main product, the iPhone, the problem arises from being too dependent on it. If any disruptive move were to be taken by a competitor in the smartphone business, Apple would be severely damaged. Their sales in that industry were likely to reduce and, due to the sales' weight of smartphones in the total sales of Apple products, the company might not be able to recover so easily. Therefore, the company should take a different approach on its smartphone to keep its competitive position and a sustainable strategy. Apple must continue innovating and launching unique smartphones to maintain customer loyalty and purchase intention. Moreover, maintaining its design thinking philosophy and product innovation is crucial if they want to stay ahead of their competitors, and not behind, like it is happening. Hence, Apple needs to reason that technological, consumer, and demographic changes result in new demands and multifarious expectations.

Additionally, Apple's dependence on their brand to be recognized as an innovative company might have a negative impact in the future. In fact, Apple´s incentives to innovate are lower and lower as the company reaches a more matured development stage, since more capital is at risk and more stakeholders are involved. Hence, right now Apple is maybe holding on to a former characteristic. It might be that the management style of Tim Cook has some influence in it, since he is more cautious, goal oriented and with a close control of the risks. Even so, there are other aspects to improve first, which ultimately are believed to change Cook's perspective. Moreover, Apple should aim to penetrate developing countries to increase its market share regarding its products or even services, using it to affirm the company more.

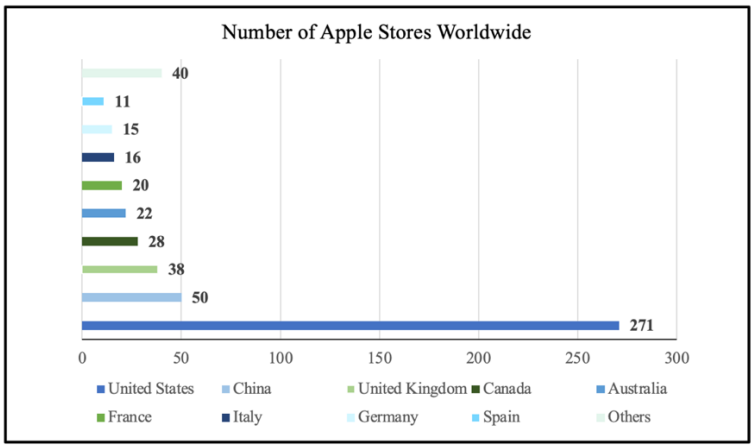
The company is not as disruptive as it once was. The current situation requires that decisions at the highest-level need to consider all the different stakeholders, the risks, and the brand sustainability. Nonetheless, from their precautious approach one new product must arise. The goal is for it to diminish Apple's dependence on the iPhone and re-align the company with the brand perception consumers have. For that, Apple is currently focusing majorly on product

development. However, the company should also study market development as a strategy to enter new markets, namely China.

Apple is always dependent on market external changes, such as the US-China strain, that could adversely affect the company's supply chain network. Even if the Covid-19 pandemic was an unequaled event in which measures could not have been taken, for this there might be a solution. Apple should expand its network of suppliers to improve its supply chain efficiency. Moreover, this expansion should go through the distribution network as well, in order to enlarge its market reach and presence. Apple must be aware that its superior position today does not guarantee a future tomorrow. It is urgent that Tim Cook continuously evolves its products and services and pursues innovative approaches to product development, if he wants Apple to keep being the brand of the great.

Appendixes

Exhibit 1: Total number of Apple Stores worldwide in May 2021.



Source: *Statista.*

Exhibit 2: Consolidated statements of operations and balance sheets of Apple Inc. for the fiscal year of 2020.

Apple Inc.

CONSOLIDATED STATEMENTS OF OPERATIONS
(In millions, except number of shares which are reflected in thousands and per share amounts)

	Years ended		
	September 26, 2020	September 28, 2019	September 29, 2018
Net sales:			
Products	$ 220,747	$ 213,883	$ 225,847
Services	53,768	46,291	39,748
Total net sales	274,515	260,174	265,595
Cost of sales:			
Products	151,286	144,996	148,164
Services	18,273	16,786	15,592
Total cost of sales	169,559	161,782	163,756
Gross margin	104,956	98,392	101,839
Operating expenses:			
Research and development	18,752	16,217	14,236
Selling, general and administrative	19,916	18,245	16,705
Total operating expenses	38,668	34,462	30,941
Operating income	66,288	63,930	70,898
Other income/(expense), net	803	1,807	2,005
Income before provision for income taxes	67,091	65,737	72,903
Provision for income taxes	9,680	10,481	13,372
Net income	$ 57,411	$ 55,256	$ 59,531
Earnings per share:			
Basic	$ 3.31	$ 2.99	$ 3.00
Diluted	$ 3.28	$ 2.97	$ 2.98
Shares used in computing earnings per share:			
Basic	17,352,119	18,471,336	19,821,510
Diluted	17,528,214	18,595,651	20,000,435

Apple Inc.

CONSOLIDATED BALANCE SHEETS
(In millions, except number of shares which are reflected in thousands and par value)

	September 26, 2020	September 28, 2019
ASSETS:		
Current assets:		
Cash and cash equivalents	$ 38,016	$ 48,844
Marketable securities	52,927	51,713
Accounts receivable, net	16,120	22,926
Inventories	4,061	4,106
Vendor non-trade receivables	21,325	22,878
Other current assets	11,264	12,352
Total current assets	143,713	162,819
Non-current assets:		
Marketable securities	100,887	105,341
Property, plant and equipment, net	36,766	37,378
Other non-current assets	42,522	32,978
Total non-current assets	180,175	175,697
Total assets	$ 323,888	$ 338,516
LIABILITIES AND SHAREHOLDERS' EQUITY:		
Current liabilities:		
Accounts payable	$ 42,296	$ 46,236
Other current liabilities	42,684	37,720
Deferred revenue	6,643	5,522
Commercial paper	4,996	5,980
Term debt	8,773	10,260
Total current liabilities	105,392	105,718
Non-current liabilities:		
Term debt	98,667	91,807
Other non-current liabilities	54,490	50,503
Total non-current liabilities	153,157	142,310
Total liabilities	258,549	248,028
Commitments and contingencies		
Shareholders' equity:		
Common stock and additional paid-in capital, $0.00001 par value: 50,400,000 shares authorized; 16,976,763 and 17,772,945 shares issued and outstanding, respectively	50,779	45,174
Retained earnings	14,966	45,898
Accumulated other comprehensive income/(loss)	(406)	(584)
Total shareholders' equity	65,339	90,488
Total liabilities and shareholders' equity	$ 323,888	$ 338,516

Source: *Apple Investor Relations.*

Exhibit 3: Consolidated statements of operations and balance sheets of Apple Inc. for the third quarter of 2021.

Apple Inc.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)
(In millions, except number of shares which are reflected in thousands and per share amounts)

	Three Months Ended		Nine Months Ended	
	June 26, 2021	June 27, 2020	June 26, 2021	June 27, 2020
Net sales:				
Products	$ 63,948	$ 46,529	$ 232,309	$ 170,598
Services	17,486	13,156	50,148	39,219
Total net sales	81,434	59,685	282,457	209,817
Cost of sales:				
Products	40,899	32,693	149,476	116,089
Services	5,280	4,312	15,319	13,461
Total cost of sales	46,179	37,005	164,795	129,550
Gross margin	35,255	22,680	117,662	80,267
Operating expenses:				
Research and development	5,717	4,758	16,142	13,774
Selling, general and administrative	5,412	4,831	16,357	14,980
Total operating expenses	11,129	9,589	32,499	28,754
Operating income	24,126	13,091	85,163	51,513
Other income/(expense), net	243	46	796	677
Income before provision for income taxes	24,369	13,137	85,959	52,190
Provision for income taxes	2,625	1,884	11,830	7,452
Net income	$ 21,744	$ 11,253	$ 74,129	$ 44,738
Earnings per share:				
Basic	$ 1.31	$ 0.65	$ 4.42	$ 2.56
Diluted	$ 1.30	$ 0.65	$ 4.38	$ 2.54
Shares used in computing earnings per share:				
Basic	16,629,371	17,250,291	16,772,656	17,450,284
Diluted	16,781,735	17,419,154	16,941,527	17,618,778

Apple Inc.

CONDENSED CONSOLIDATED BALANCE SHEETS (Unaudited)
(In millions, except number of shares which are reflected in thousands and par value)

	June 26, 2021	September 26, 2020
ASSETS:		
Current assets:		
Cash and cash equivalents	$ 34,050	$ 38,016
Marketable securities	27,646	52,927
Accounts receivable, net	17,475	16,120
Inventories	5,178	4,061
Vendor non-trade receivables	16,433	21,325
Other current assets	13,641	11,264
Total current assets	114,423	143,713
Non-current assets:		
Marketable securities	131,948	100,887
Property, plant and equipment, net	38,615	36,766
Other non-current assets	44,854	42,522
Total non-current assets	215,417	180,175
Total assets	$ 329,840	$ 323,888
LIABILITIES AND SHAREHOLDERS' EQUITY:		
Current liabilities:		
Accounts payable	$ 40,409	$ 42,296
Other current liabilities	43,625	42,684
Deferred revenue	7,681	6,643
Commercial paper	8,000	4,996
Term debt	8,039	8,773
Total current liabilities	107,754	105,392
Non-current liabilities:		
Term debt	105,752	98,667
Other non-current liabilities	52,054	54,490
Total non-current liabilities	157,806	153,157
Total liabilities	265,560	258,549
Commitments and contingencies		
Shareholders' equity:		
Common stock and additional paid-in capital, $0.00001 par value: 50,400,000 shares authorized; 16,556,942 and 16,976,763 shares issued and outstanding, respectively	54,989	50,779
Retained earnings	9,233	14,966
Accumulated other comprehensive income/(loss)	58	(406)
Total shareholders' equity	64,280	65,339
Total liabilities and shareholders' equity	$ 329,840	$ 323,888

Source: *Apple Investor Relations.*

Exhibit 4: Disaggregated revenues by Apple's significant products and services for the fiscal year of 2020.

		Revenues (billion dollars)		
		2020	2019	2018
Product	iPhone	137,781	142,381	164,888
	Mac	28,662	25,740	25,198
	iPad	23,724	21,280	18,380
	Wearables, Home and Accessories	30,620	24,482	17,381
	Services	53,768	46,291	39,748
	Total Net Sales	$ 274,515	$ 260,174	$ 265,595

Source: *Apple Investor Relations.*

Exhibit 5: Apple Inc. liquidity ratios corresponding to the interval between 2016 to 2020.

Liquidity Ratios					
Ratios	**2020**	**2019**	**2018**	**2017**	**2016**
Current Ratio	1.36	1.54	0.80	0.96	1.08
Cash Ratio	0.36	0.46	0.22	0.20	0.26
Quick Ratio	1.33	1.50	0.77	0.91	1.05

Source: *Quality Business Plan.*

Exhibit 6: Apple Inc. total asset turnover corresponding to the interval between 2016 to 2020.

Asset Utilization					
Ratios	**2020**	**2019**	**2018**	**2017**	**2016**
Total Asset Turnover	0.85	0.77	0.73	0.61	0.67
Fixed Asset Turnover	7.47	6.96	6.43	6.79	7.98

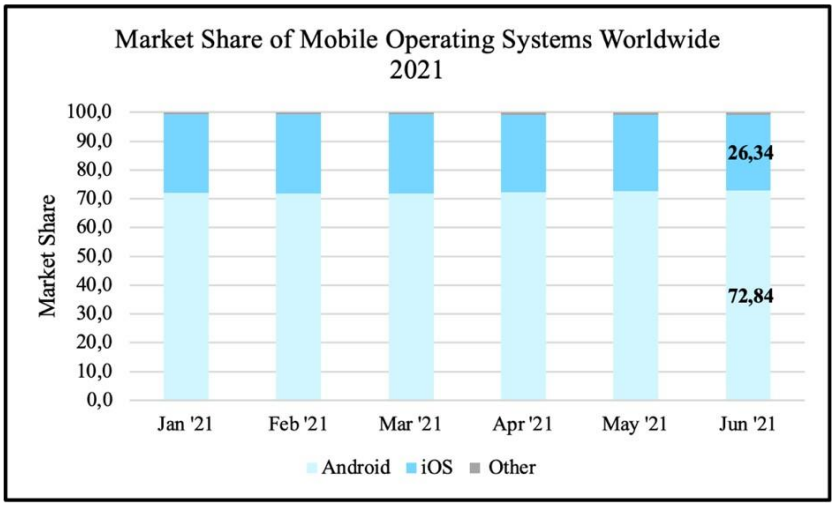
Source: *Quality Business Plan.*

Exhibit 7: Apple Inc. profitability ratios corresponding to the interval between 2016 to 2020.

Profitability Ratios (in %)					
Ratios	**2020**	**2019**	**2018**	**2017**	**2016**
Return on Assets	17.73	16.32	16.28	12.88	10.16
Return on Equity	87.87	61.06	53.83	36.03	25.61
Net Profit Margin	20.91	21.24	22.41	21.09	15.16
Gross Profit Margin	38.23	37.82	38.34	38.47	39.08
Operating Profit Margin	24.15	24.57	22.59	22.33	22.96

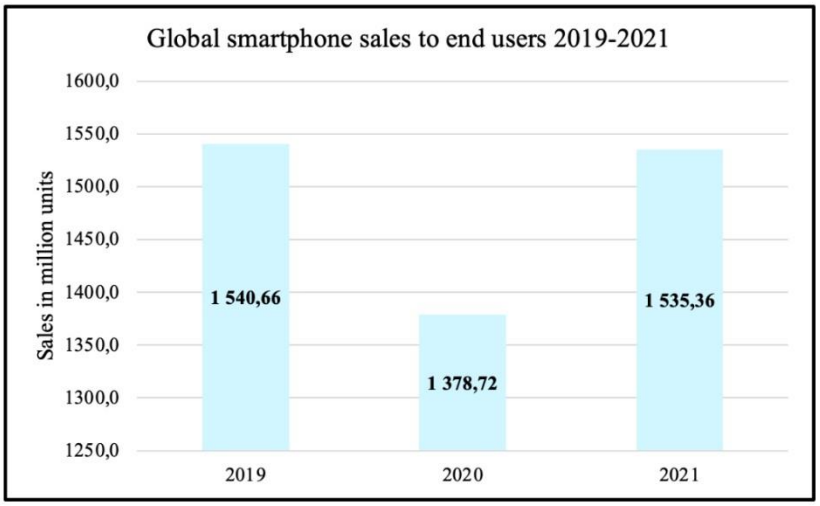
Source: *Quality Business Plan.*

Exhibit 8: Mobile operating systems' market share worldwide from 2021



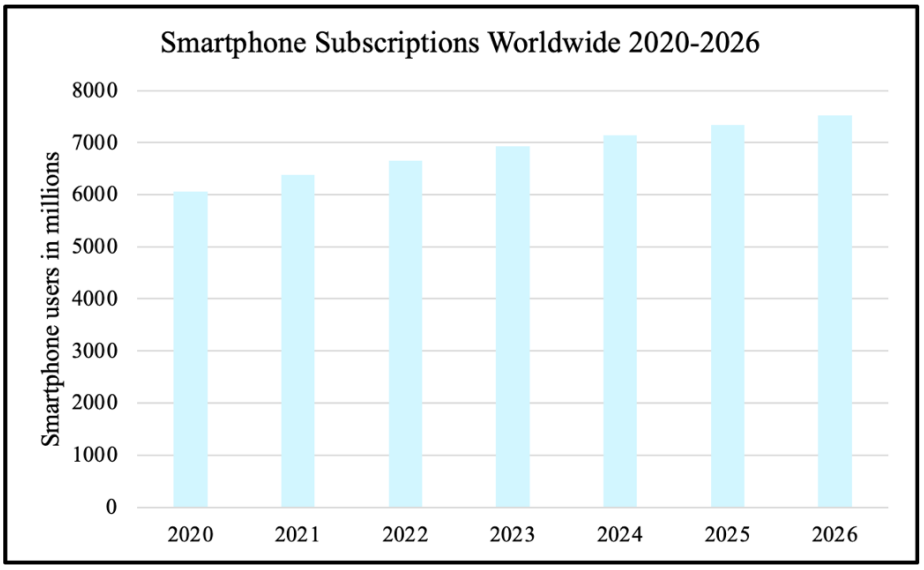
Source: *Statista.*

Exhibit 9: Number of smartphones sold to end users worldwide from 2019 to 2021 (in million units).



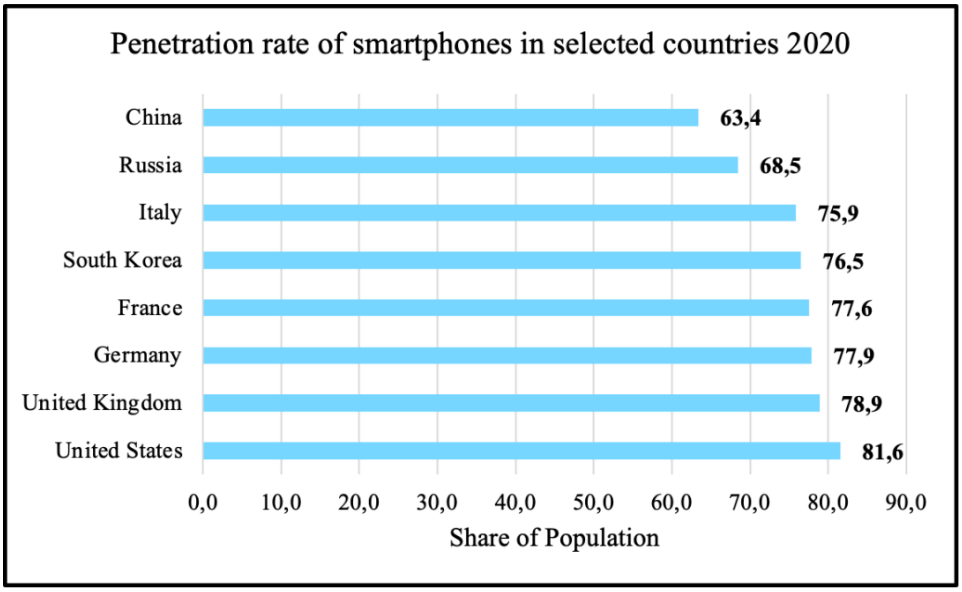
Source: *Statista.*

Exhibit 10: Number of smartphone subscriptions worldwide from 2020 to 2026 (in millions).



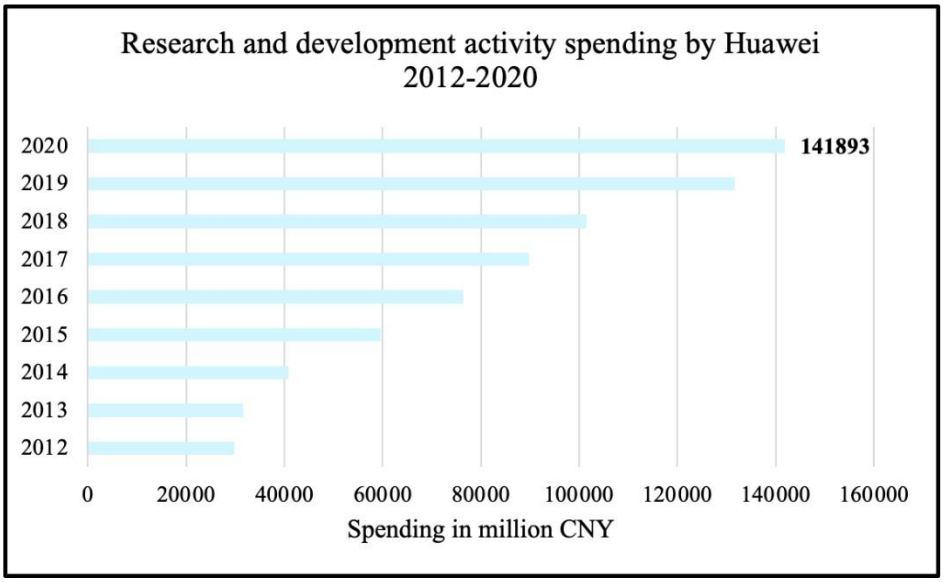
Source: *Statista.*

Exhibit 11: Penetration rate of smartphones in selected countries in the year of 2020.



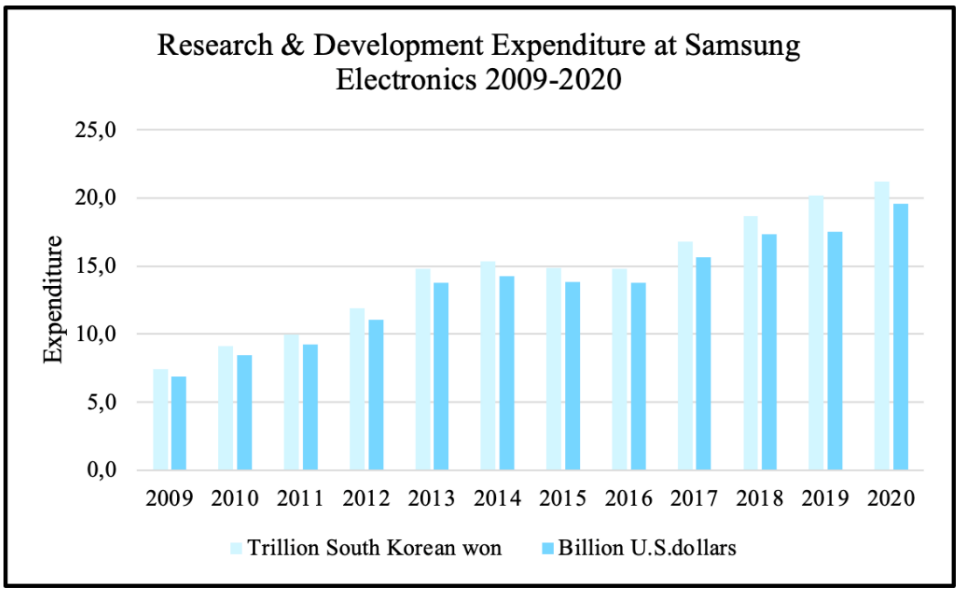
Source: *Statista.*

Exhibit 12: Huawei´s research and development activity spending from 2012 to 2020 (in million CNY).



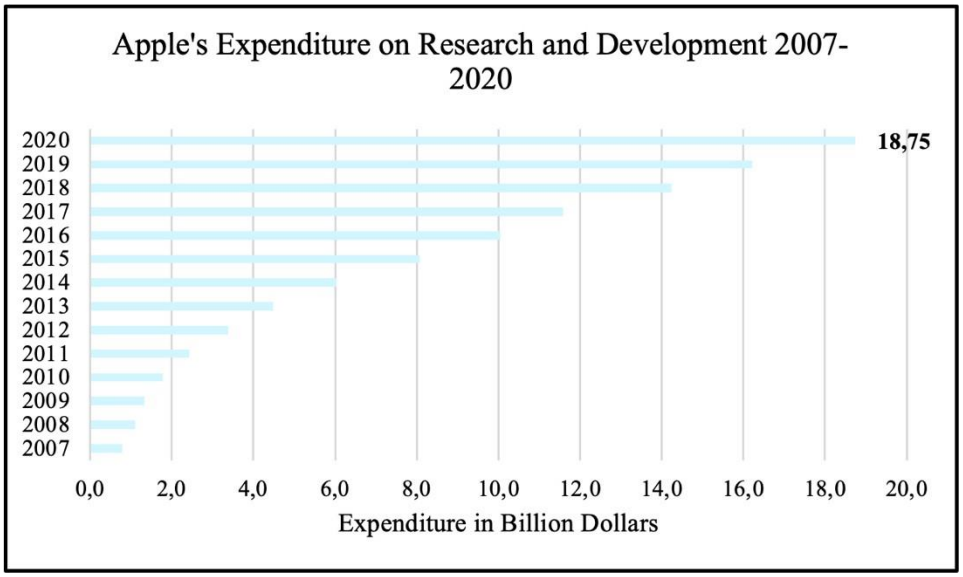
Source: *Statista.*

Exhibit 13: Global research and development expenditure at Samsung Electronics between 2009 and 2020 (in trillion South Korean won/billion U.S. dollars).



Source: *Statista.*

Exhibit 14: Apple Inc's expenditure on research and development from the fiscal year 2007 to 2020 (in billion U.S. dollars).



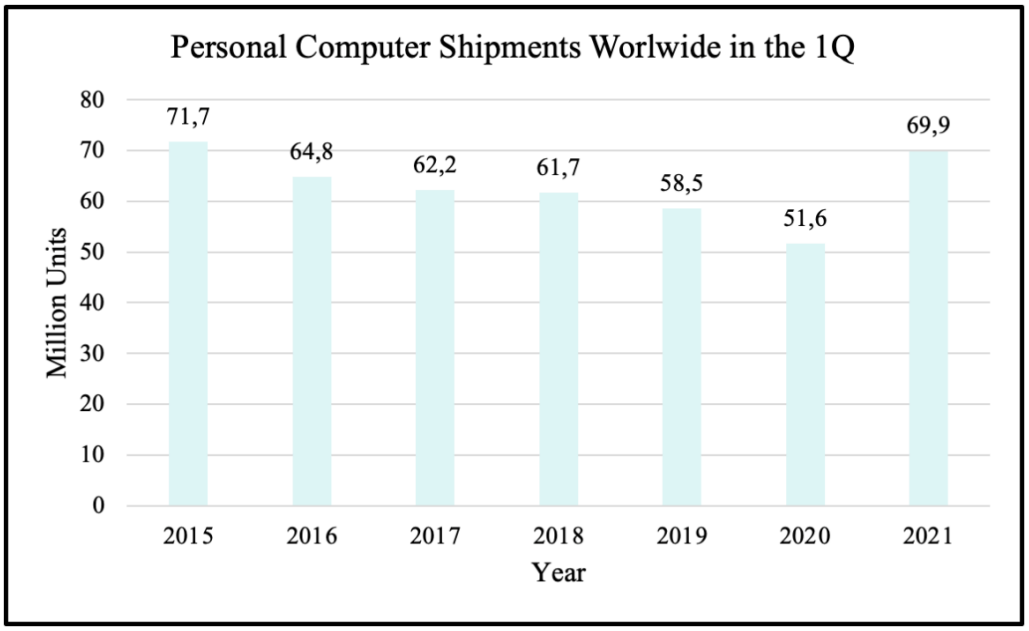
Source: *Statista.*

Exhibit 15: Ranking of leading mobile phone brands worldwide in 2019, by shipments, sales, and profit.

Leading mobile phone brands worldwide 2019, by shipments, sales, profit			
Company	**Units Shipped (in millions)**	**Profit (in million U.S. dollars)**	**Sales (in million U.S. dollars)**
Samsung	315	18947	170625
Apple	215	48351	229234
Huawei	152	6890	87646
Oppo	111	1400	60000
Vivo	95	1125	46484
Xiaomi	95	1000	17000
LG	55	110	46800
Lenovo	50	535	43035
ZTE	45	719	17123
Alcatel-Lucent	20	218	15149

Source: *Statista.*

Exhibit 16: First quarter personal computer shipments worldwide, considering all manufacturers (in millions of units).



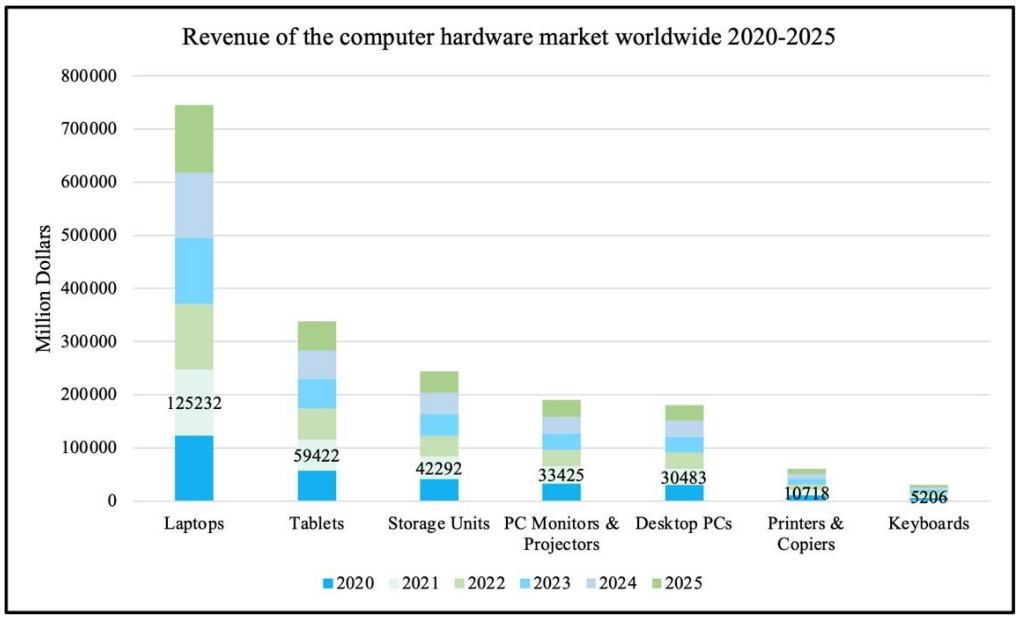
Source: *Gartner*.

Exhibit 17: Worldwide traditional personal computer shipments, market share, and year-over-year growth corresponding the top 5 global companies in the second quarter of 2021 (in millions of units).

Company	2Q21 Shipments (in millions)	2Q21 Market Share (in %)	2Q20 Shipments (in millions)	2Q20 Market Share (in %)	2Q21/2Q20 Growth (in %)
Lenovo	20,005	23.9	17,407	23.6	14.9
HP Inc.	18,594	22.2	18,104	24.5	2.7
Dell Techonolgies	13,976	16.7	12,010	16.3	16.4
Apple	6,156	7.4	5,630	7.6	9.4
Acer	6,088	7.3	5,177	7.0	17.6
Others	18,795	22.5	15,551	21.0	20.9
Total	83,614	100.0	73,879	100.0	13.2

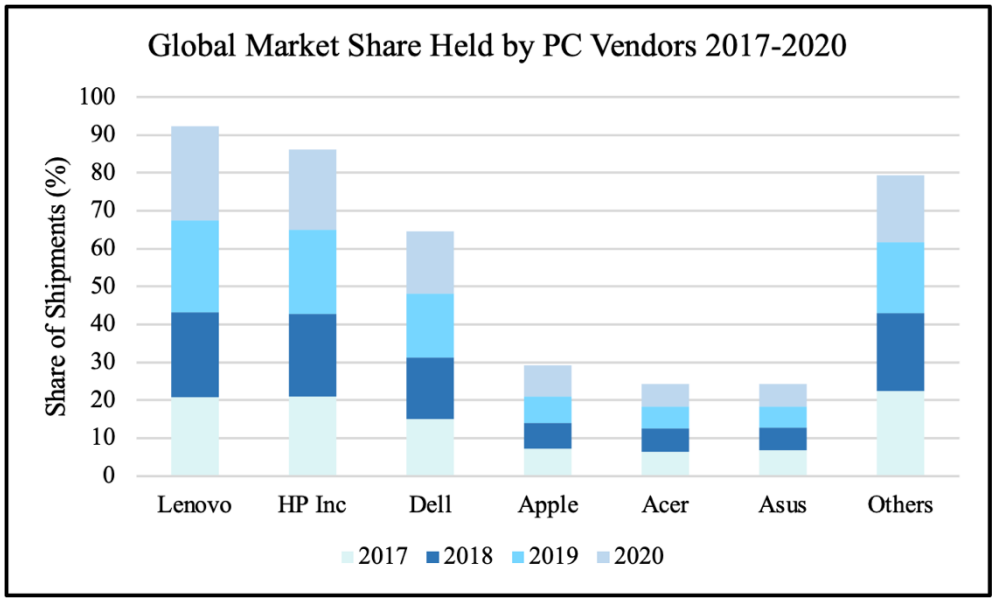
Source: *IDC Quarterly Personal Computing Device Tracker*.

Exhibit 18: Revenues of the computer hardware market worldwide between 2020 and 2025, by segment (in millions of dollars).



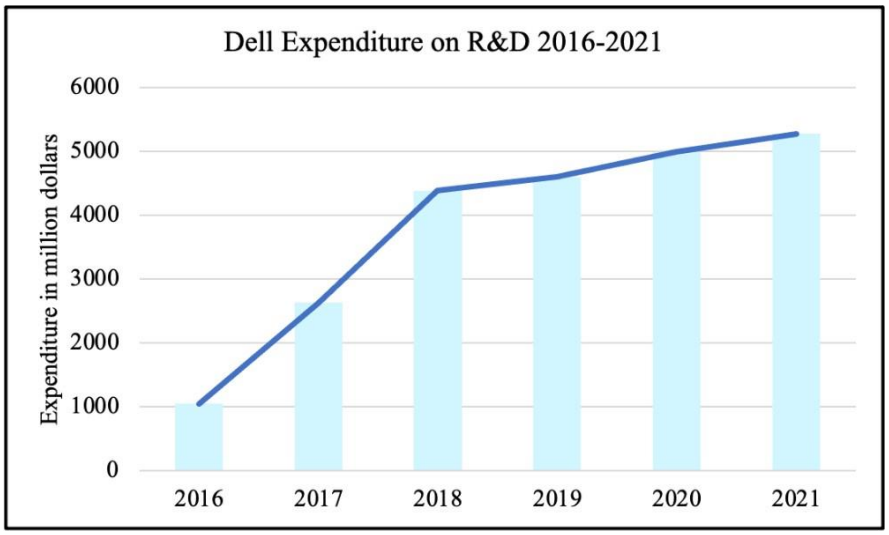
Source: *Statista.*

Exhibit 19: Market share held by the leading personal computer vendors worldwide from 2017 to 2020.



Source: *Statista.*

Exhibit 20: Dell Technologies Expenditure on research and development worldwide from 2016 to 2021 (in millions of dollars).



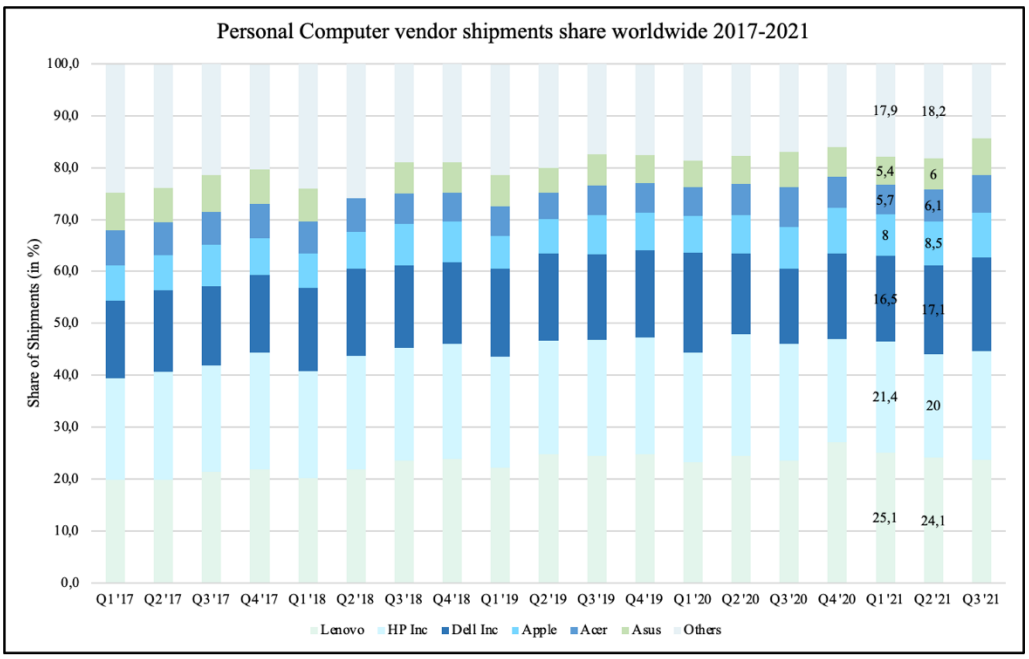
Source: *Statista.*

Exhibit 21: Worldwide traditional personal computer shipments, market share, and year-over-year growth corresponding the top 5 global companies in the first quarter of 2021 (in millions of units).

Company	1Q21 Shipments (in millions)	1Q21 Market Share (in %)	1Q20 Shipments (in millions)	1Q20 Market Share (in %)	1Q21/1Q20 Growth (in %)
Lenovo	17,548	25.1	12,330	23.3	42.3
HP Inc.	14,963	21.4	11,119	21.0	34.6
Dell Techon	11,542	16.5	10,226	19.3	12.9
Apple	5,572	8.0	3,751	7.1	48.6
Acer	3,968	5.7	2,905	5.5	36.6
ASUS	3,742	5.4	2,679	5.1	39.7
Others	12,532	17.9	9,915	18.7	26.4
Total	69,869	100.0	52,928	100.0	32.0

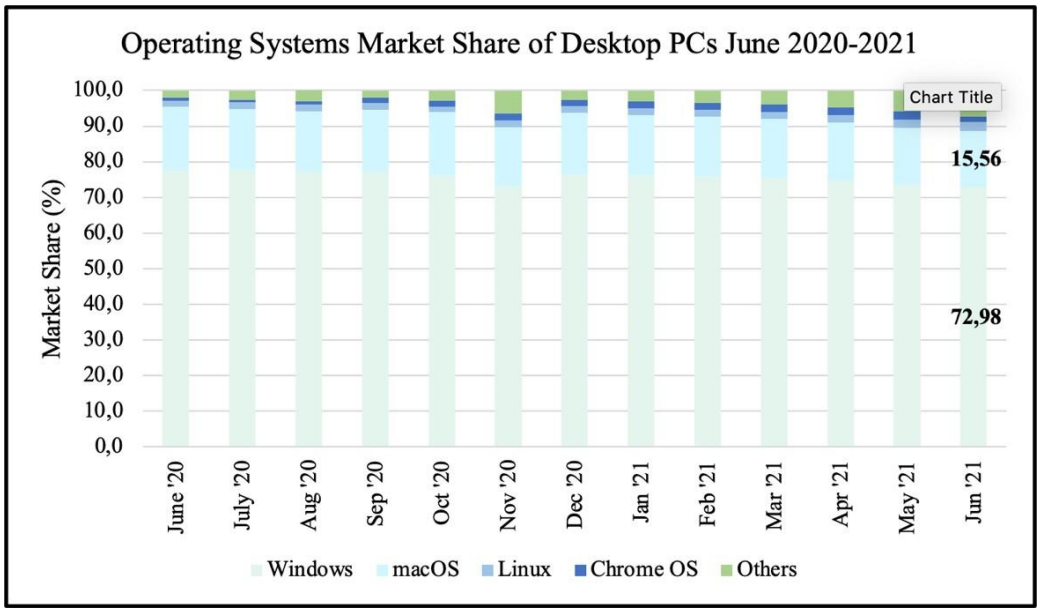
Source: *Gartner.*

Exhibit 22: Quarterly market share of personal computer shipments worldwide from 2017 to 2021 by quarter, by vendor



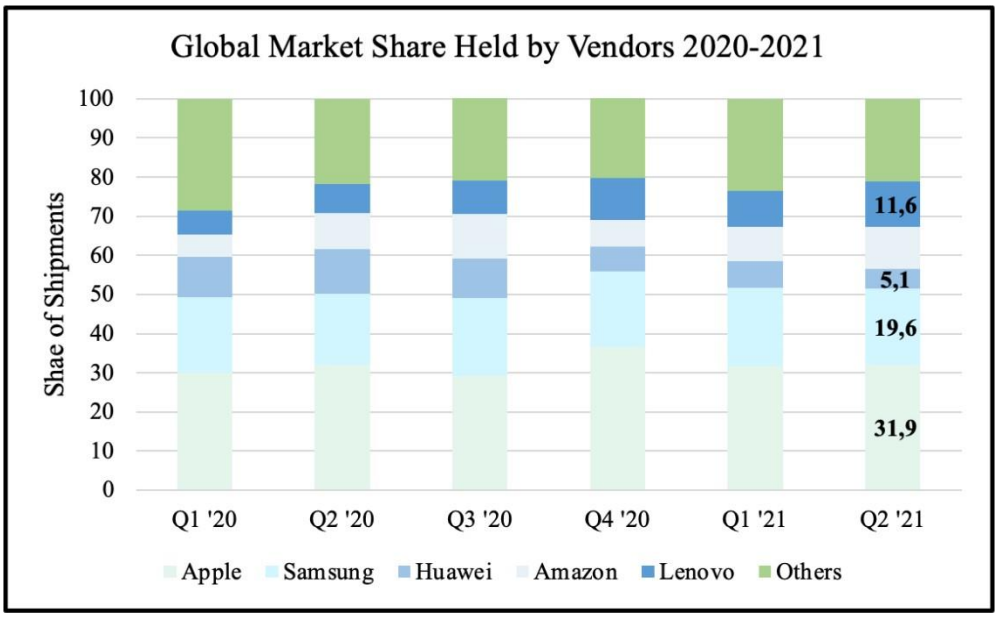
Source: *Statista.*

Exhibit 23: Global market share held by operating systems for desktop PCs, from June 2020 to June 2021.



Source: *Statista.*

Exhibit 24: Tablet shipments market share by vendor worldwide from the first quarter of 2020 to 2021's second quarter.



Source: *Statista.*

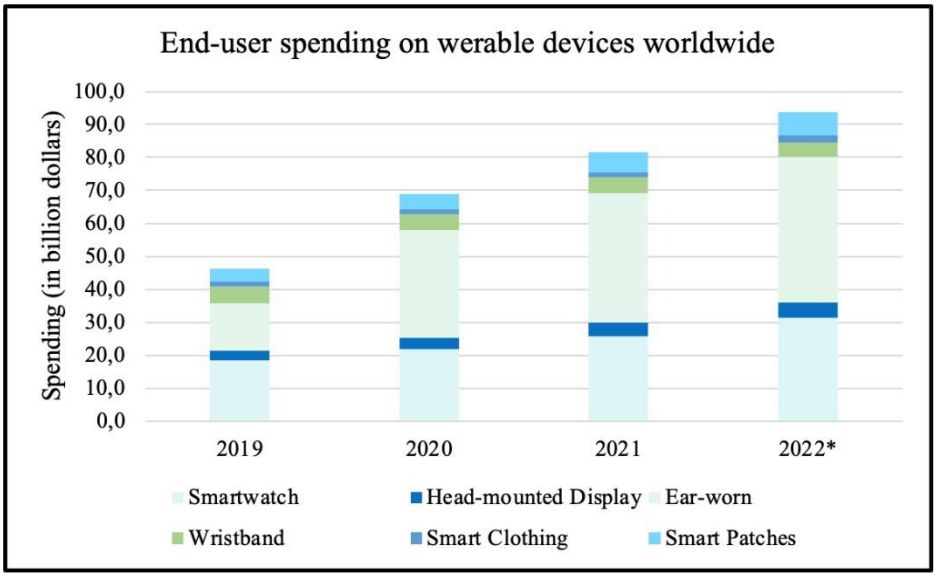
Exhibit 25: Household appliances & electronic study regarding the satisfaction of consumers with personal computers, for the 2020/2021time frame.

American Customer Satisfaction Index: Personal Computers			
Company	**2019**	**2020**	**% Change**
Apple	83	82	-1
Samsung	81	81	0
Acer	77	78	1
Amazon	79	78	-1
ASUS	76	77	1
Dell	77	77	0
HP	78	77	-1
Lenovo	74	76	3
Others	77	75	-3

0 - 100 Scale

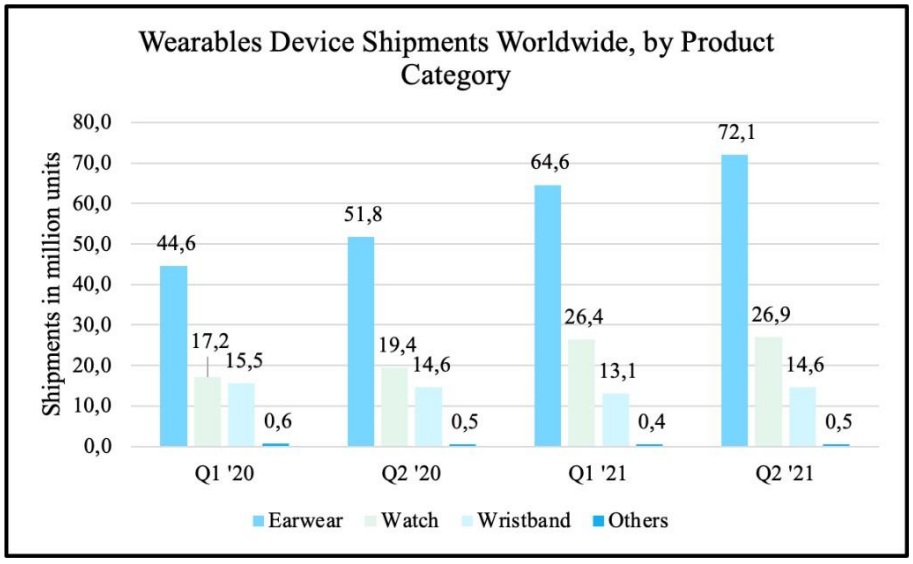
Source: *American Customer Satisfaction Index.*

Exhibit 26: Worldwide ender-user spending on wearable devices from 2019 to 2022, by category (in billion dollars).



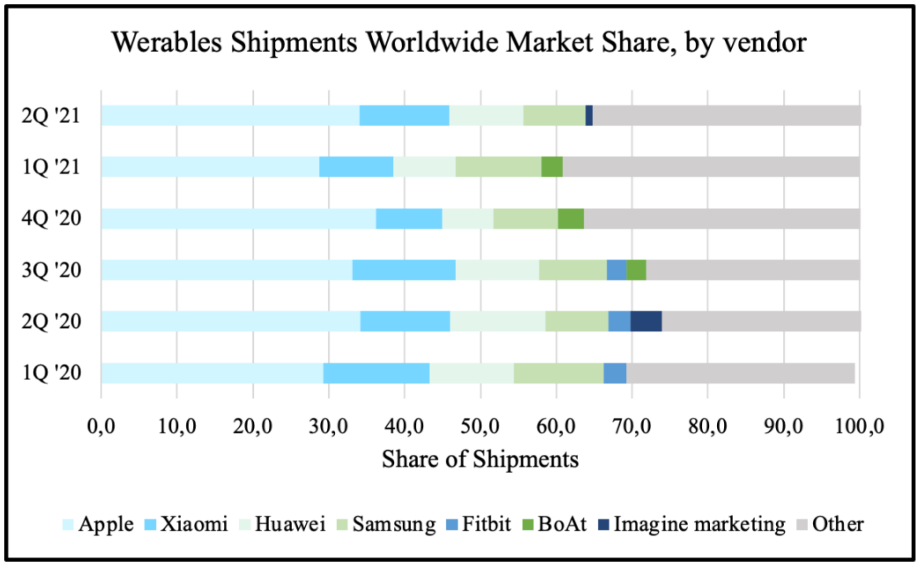
Source: *Statista.*

Exhibit 27: Global wearable device shipments in 1st quarter 2020 to 2nd quarter 2021, by product category (in millions).



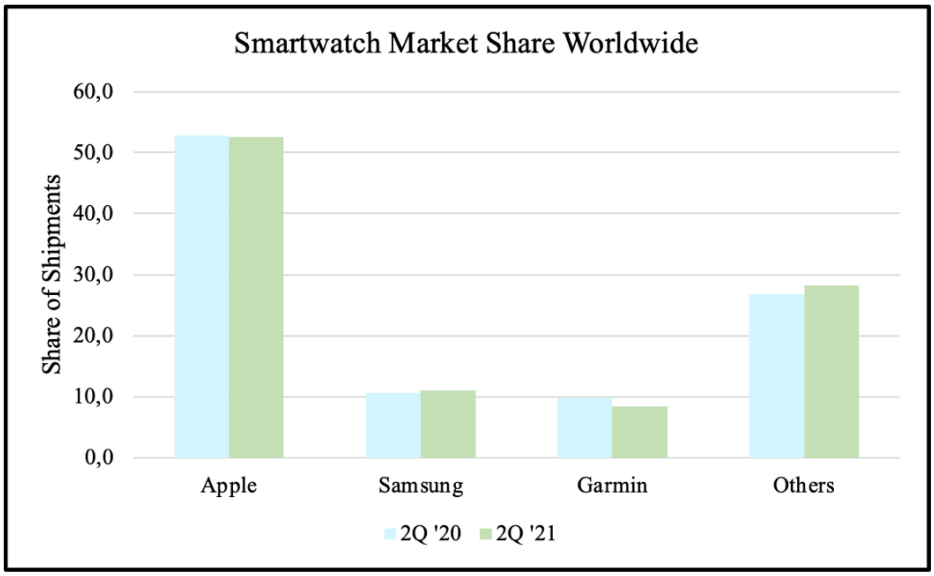
Source: *Statista.*

Exhibit 28: Market share of wearables unit shipments worldwide from 2020's first quarter to the second quarter of 2021, by vendor.



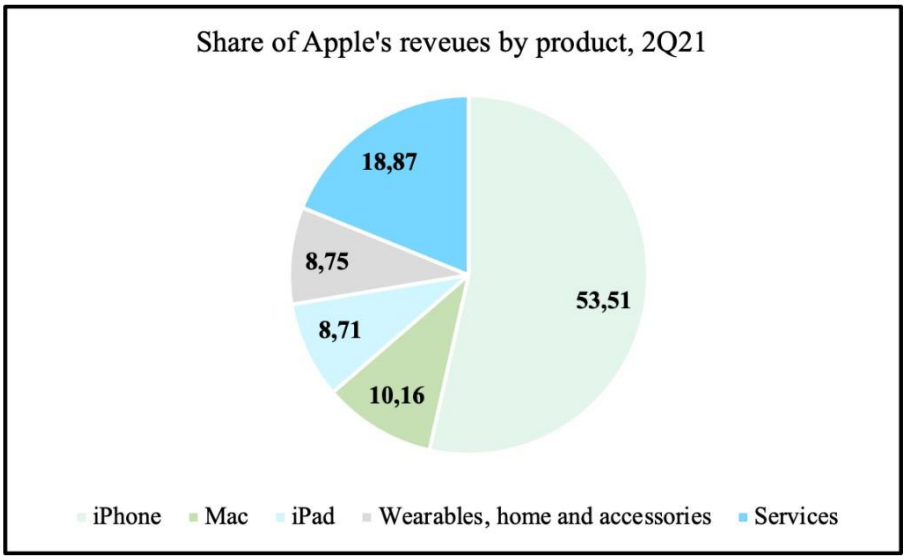
Source: *Statista.*

Exhibit 29: Market share of smartwatch unit shipments worldwide for the second quarter of 2020 and 2021, by vendor.



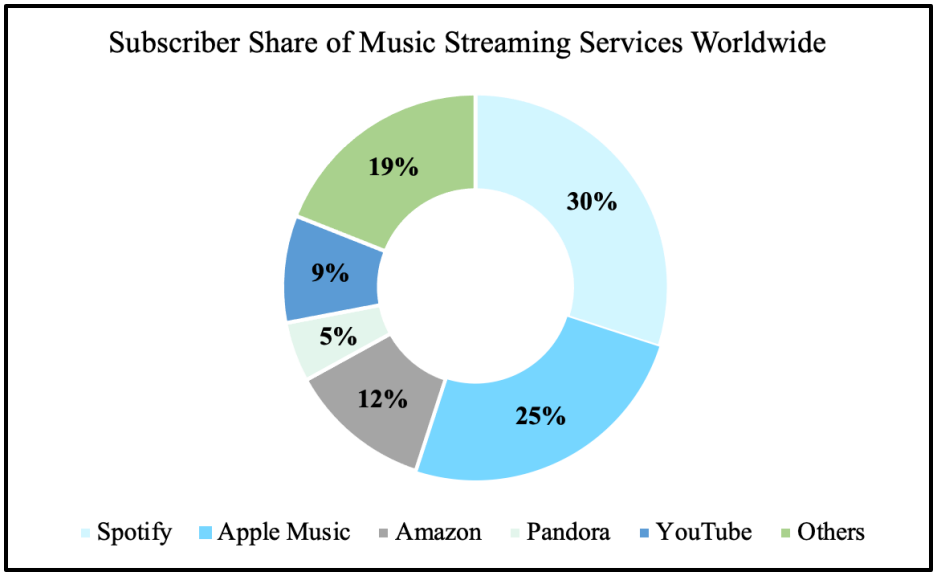
Source: *Statista.*

Exhibit 30: Share of Apple's revenue by product category from the second quarter of 2021.



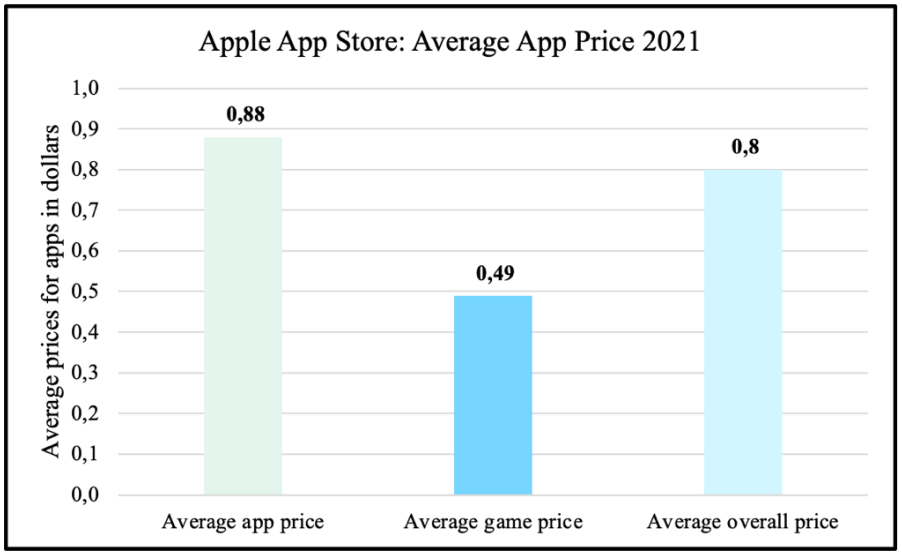
Source: *Statista.*

Exhibit 31: Share of music streaming subscribers worldwide in the first quarter of 2020, by company.



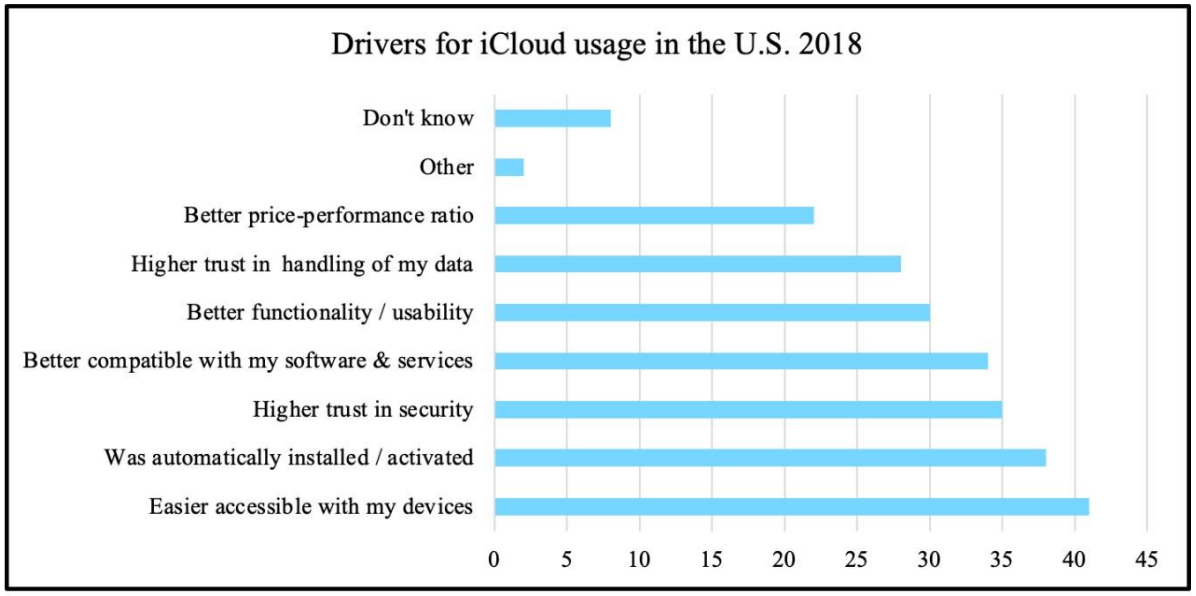
Source: *Statista.*

Exhibit 32: Average prices for apps in the Apple App Store as of July 2021 (in dollars).



Source: *Statista.*

Exhibit 33: Study conducted in the United States regarding the reasons behind the decision of using the iCloud as opposed to other solutions.



478 respondents; 18-69 years

Source: *Statista.*

Exhibit 34: Porter's Five Forces analysis of the smartphone industry.

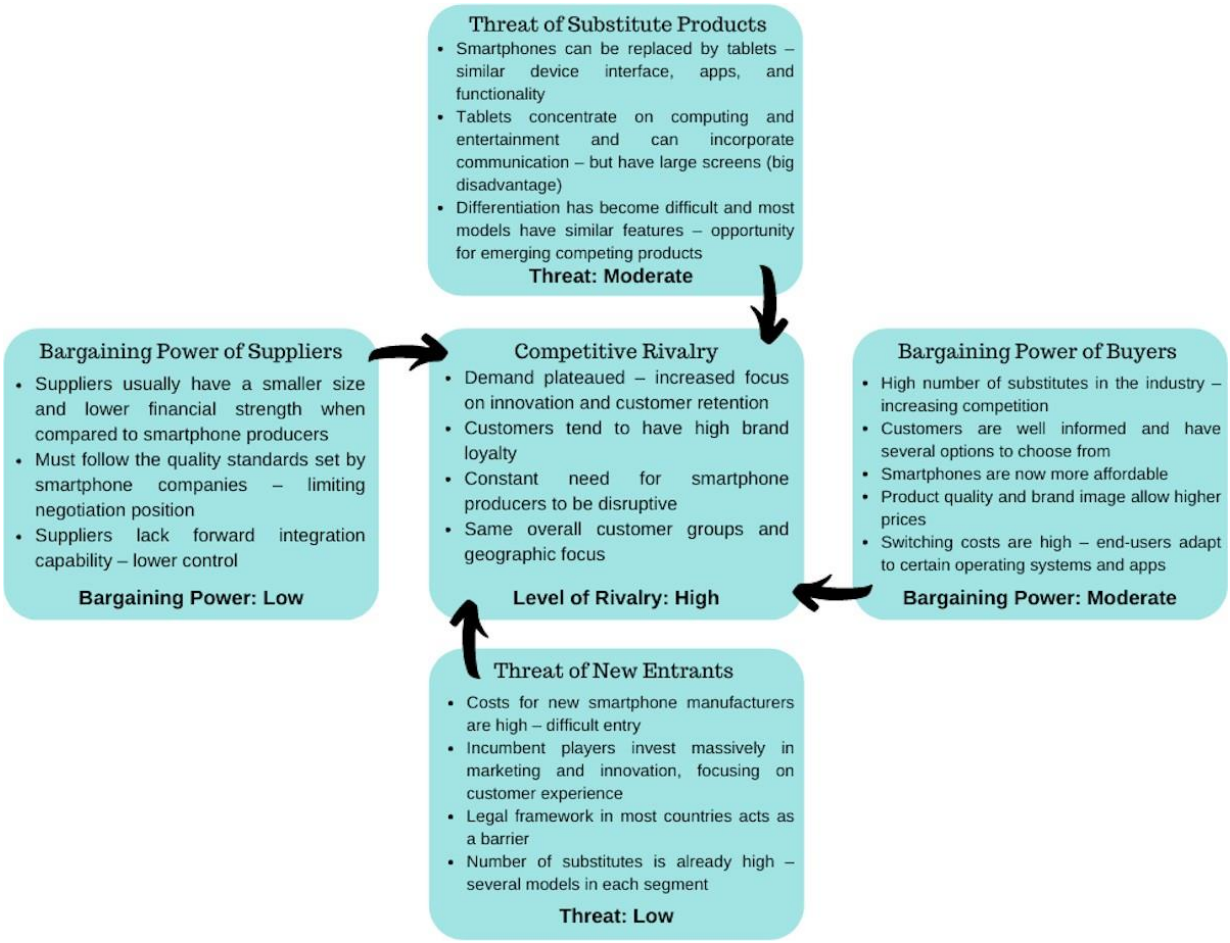
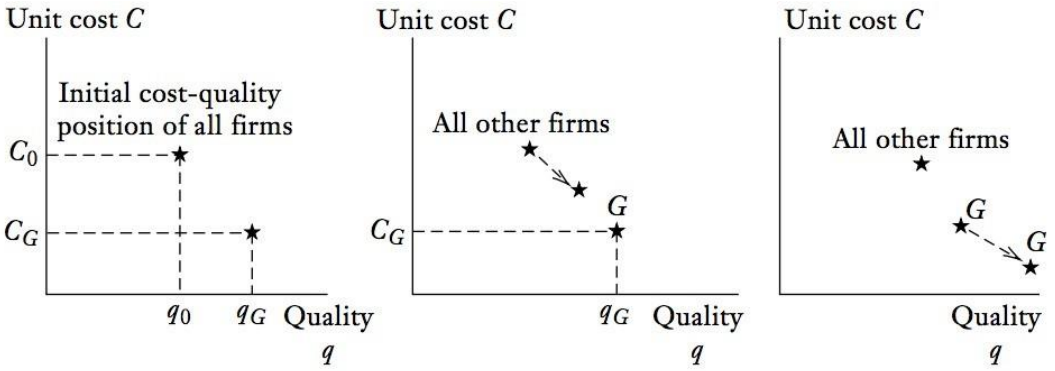


Exhibit 35: Impediments to imitation and early-mover advantages framework.



Source: Besanko, David, David Dranove, Mark Shanley, and Scott Schaefer. 1996.

Economics Of Strategy. 1st ed. New York: Wiley. p. 372.

References

Case Study

1. The discussion of Apple's history is based mostly on Linzmayer, Owen W. 2004. *Apple Confidential 2.0: The Definitive History of The World's Most Colourful Company*. 1st ed. San Francisco, California: Wiliam Pollock. Unless otherwise attributed, all quotations and all data cited in this section are drawn from this book.

2. Yoffie, David B., and Eric Baldwin. 2019. "Apple Inc. In 2018". *Harvard Business School*, 2-3.

3. Simmons, Clarke. 2007. "Falling Off the Apple Cart". *London Business School*, 37.

4. Killion, Norma. 2013. "The Leadership Evolution of Apple Computer, Incorporate". Master, Southwestern College.

5. Rothaermel, Frank T. 2019. "Apple Inc.". *Mc Graw Hill*, 2-4.

6. The discussion of "Cook takes the Helm" subsection is based on Kahney, Leander. 2019. *Tim Cook: The Genius Who Took Apple to the Next Level*. 1st ed. Portfolio/Penguin. Unless otherwise attributed, all quotations and all data cited in this section are drawn from this book.

7. Heracleous, Loizos. 2013. "Quantum Strategy At Apple Inc.". *Elsevier Inc.*, 1.

8. Eadicicco, Lisa. 2019. "Apple CEO Tim Cook Had an Impact On The Company Before He Was Even Hired". *Business Insider*. https://www.businessinsider.com/tim-cook-influenced-apple-and-steve-jobs-before-he-was-even-hired-2019-4.

9. Montgomerie, Johnna, and Samuel Roscoe. 2013. "Owning the Consumer—Getting to The Core of The Apple Business Model". *Accounting Forum*37 (4): 290-299.

10. Johnson, Katherine, Yang Li, Hang Phan, Jason Singer, and Hoang Trinh. 2012. "The Innovative Success That Is Apple, Inc.". *Marshal University*, *Marshal Digital Scholar*, 3-16.

11. "Supplier List | Fiscal Year 2020". 2021. *Apple*. https://www.apple.com/supplier-responsibility/pdf/Apple-Supplier-List.pdf.

12. Satariano, Adam, and Peter Burrows. 2011. "Apple's Supply-Chain Secret? Hoard Lasers". *Bloomerang Businessweek*, 4.

13. Kumar, Sameer, Steve Teichman, and Tobias Timpernagel. 2011. "A Green Supply Chain Is a Requirement for Profitability". *International Journal of Production Research* 50 (5): 1278- 1296.

14. Webb, Jonathan. 2017. "Apple's Supply Chain Attracts Criticism for Performance but Also Praise for Sustainability". *Forbes*. https://www.forbes.com/sites/jwebb/2017/10/30/apples- supply-chain-attracts-criticism-for-performance-but-also-praise-for- sustainability/?sh=4a0c33197398.

15. "Apple Commits to Be 100 Percent Carbon Neutral for Its Supply Chain and Products By 2030". 2021. *Apple Newsroom*. https://www.apple.com/newsroom/2020/07/apple-commits-to- be-100-percent-carbon-neutral-for-its-supply-chain-and-products-by-2030/.

16. Apple's Financial Outlook discussion is based mostly on Borosky, Paul. 2021. "Apple Inc.

Financial Statements and Financial Ratios Analyzed From 2016 To 2020". *Quality Business Plan*, 13-66. Unless otherwise attributed, all quotations and all data cited in this section are drawn from this report.

17. Reid, Alan J. 2018. "A Brief History of The Smartphone". *The Smartphone Paradox*, 35- 66.

18. Eadicicco, Lisa. 2021. "The Smartphone Market is a 2-Horse Race Between Apple and Samsung, And LG is the Latest Casualty". *Business Insider*. https://www.businessinsider.com/lg-shutting-down-smartphone-business-samsung-apple- 2021-4.

19. Scarsella, Anthony, Bryan Ma, Nabila Popal, Michael Shirer, and Ryan Reith. 2021. "Smartphone Shipments Return to Positive Growth in The Fourth Quarter Driven by Record

Performance by Apple, According To IDC". *IDC: The Premier Global Market Intelligence Company*. https://www.idc.com/getdoc.jsp?containerId=prUS47410621.

20. Kharpal, Arjun. 2021. "China's Xiaomi Overtakes Apple in The Global Smartphone Market". *CNBC*. https://www.cnbc.com/2021/07/16/chinas-xiaomi-overtakes-apple-in-global-smartphone-market.html.

21. Suryanegara, Muhammad. 2016. "5G As Disruptive Innovation: Standard and Regulatory Challenges at a Country Level". *International Journal of Technology*, 636-641.

22. Lópes-Perez, David, and C. Wang. 2020. "Global Impact of 5G Network Topology". *IDOSR Journal of Arts and Management* 5 (1): 58-63.

23. Goggin, Gerard. 2009. "Adapting the Mobile Phone: The iPhone and its Consumption". *Continuum* 23 (2): 231-244.

24. Chin, Monica. 2017. "Here's Everything That's Exclusive to the iPhone X". *Mashable*. https://mashable.com/article/everything-unique-to-iphone-x.

25. "iPhone 13 Pro". 2021. *Apple*. https://www.apple.com/us-hed/shop/buy-iphone/iphone-13- pro/6.1-inch-display-128gb-sierra-blue-unlocked.

26. Nelson, Josh. 2020. "How Apple's Design Process Created the Future". *UX Collective*.

27. Yeung, Natalie. 2021. "The Marketing Strategy for iPhone". *Profolus*. https://www.profolus.com/topics/marketing-strategy-for-iphone/.

28. Habib, Huzayfah. 2020. "iPhone 12, Apple's New Strategy and Its Competitors". *The Next Tech*. https://www.the-next-tech.com/gadgets/iphone-12-apples-new-strategy-and-its- competitors/.

29. He, Meihan. 2021. "Analysis of iPhone's Marketing Strategy". *Atlantis Press* 166: 669-672.

30. Castro, Daniel. 2021. "6 Lessons from Apple Events". *The Storytellers*. https://thestorytellers.com/6-lessons-apple-events/.

31. Carlson, Peter E. 2006. "Personal Computer Industry Trends", 1-9.

32. Statista Research, Department. 2021. "Sales Volume Growth of The Computer Hardware Market Worldwide 2013-2025, By Segment". *Statista*.

33. "What Is a Tablet Computer?". 2021. *Lenovo*. https://www.lenovo.com/us/en/faqs/laptop-faqs/what-is-a-tablet-pc/?orgRef=https%253A%252F%252Fwww.google.pt%252F.

34. Si, Ma. 2021. "Lenovo Doubling R&D Investments for Edge in Digitalization". *China Daily*. https://global.chinadaily.com.cn/a/202108/18/WS611c62a6a310efa1bd66978f.html.

35. Vailshery, Lionel S. 2021. "Apple: Expenditure on Research and Development 2007-2020". *Statista*. https://www-statista-com.eu1.proxy.openathens.net/statistics/273006/apple-expenses-for-research-and-development/.

36. Niu, Evan. 2020. "Apple's New M1 Chip Could Boost Mac Margins". *The Motley Fool*. https://www.fool.com/investing/2020/11/12/apples-new-m1-chip-could-boost-mac-margins/.

37. Warren, Tom. 2021. "US PC Market Declines Due to Supply Issues Just as Windows 11 Launches". *The Verge*. https://www.theverge.com/2021/10/12/22722151/us-pc-market-decline-supply-issues-windows-11-launch.

38. "Mac". 2021. *Apple*. https://www.apple.com/mac/.

39. "Apple Inc. Form 10-K". 2021. *United States Securities and Exchange Commission*.

40. Guzide, Osman, and Samuel Sloboda. 2021. “Is Apple’s New M1 Chip a Gamechanger in Computing?”. *Proceedings of the West Virginia Academy of Science* 93 (1).

41. Villas-Boas, Antonio. 2018. "10 Reasons to Get An Apple Mac Instead of a Windows PC". *Business Insider*. https://www.businessinsider.com/apple-mac-os-vs-microsoft-windows-10-2018-5.

42. Furfie, Ben. 2010. "Is the iPad a Game Changer? [Tablet Computer from Apple]". *Engineering & Technology* 5 (4).

43. "iPad - Compare Models". 2021. *Apple*. https://www.apple.com/ipad/compare/?modelList=ipad-pro-12-9-5th-gen,ipad-9th-gen,ipad- mini-6th-gen.

44. "Best Tablets September 2021". 2021. *Benchmarks*. https://benchmarks.ul.com/compare/best-tablets?amount=200&sortBy=PERFORMANCE&reverseOrder=true&osFilter=ANDROID,IOS,WINDOWS&test=WILD_LIFE_PERFORMANCE&deviceFilter=TABLET&displaySize=3.0,15.0.

45. Wortmann, Felix, and Kristina Flüchter. 2015. "Internet of Things - Technology and Value Added". *Business & Information Systems Engineering* 57 (3): 221-224.

46. Dunn, Jessilyn, Ryan Runge, and Michael Snyder. 2018. "Wearables and The Medical Revolution". *Personalized Medicine* 15 (5): 429-448.

47. Ates, H. Ceren, Ali K. Yetisen, Firat Güder, and Can Dincer. 2021. "Wearable Devices for The Detection of COVID-19". *Nature Eletronics* 4: 13-14.

48. Piwek, Lukasz, David A. Ellis, Sally Andrews, and Adam Joinson. 2016. "The Rise of Consumer Health Wearables: Promises and Barriers". *PLOS Medicine* 13 (2).

49. Vailshery, Lionel S. 2021. "Wearables Unit Sales Share Worldwide from 2019 to 2020". *Statista*. https://www-statista-com.eu1.proxy.openathens.net/statistics/538159/share-of-global-wearables-sales-by-category/.

50. Rimol, Meghan. 2021. "Gartner Forecasts Global Spending on Wearable Devices to Total

$81.5 Billion in 2021". *Gartner*. https://www.gartner.com/en/newsroom/press-releases/2021-01-11-gartner-forecasts-global-spending-on-wearable-devices-to-total-81-5-billion-in-2021.

51. "Smart Wearable Market Trends, Size| Industry Growth 2021 to 2026". 2021. *Mordor Intelligence*. https://www.mordorintelligence.com/industry-reports/smart-wearables-market.

52. Cybart, Neil. 2021. "Apple Has a Decade-Long Lead in Wearables". *Above Avalon*. https://www.aboveavalon.com/notes/2021/5/27/apple-has-a-decade-long-lead-in-wearables.

53. Clark, Emily. 2019. "3 Ways Google Can Compete with Apple In The Wearables Market". *The Manifest*. https://themanifest.com/app-development/3-ways-google-compete-apple-wearables-market.

54. Statt, Nick. 2020. "Apple Now Sells More Watches Than the Entire Swiss Watch Industry". *The Verge*. https://www.theverge.com/2020/2/5/21125565/apple-watch-sales-2019-swiss-watch-market-estimates-outsold.

55. "Buy Apple Watch Hermès Series 7". 2021. *Apple*. https://www.apple.com/shop/buy-watch/apple-watch-hermes.

56. Cybart, Neil. 2021. "Apple Watch is Now Worn On 100 million Wrists". *Above Avalon*. https://www.aboveavalon.com/notes/2021/2/11/apple-watch-is-now-worn-on-100-million- wrists.

57. Park, Sonia. 2021. "Seamlessly Symphonic". *Western Sydney University*, 1.

58. Heater, Brian. 2021. "Apple Airpods 3 Review: Blurring the Line". *Techcrunch*. https://techcrunch.com/2021/10/25/apple-airpods-3-review-blurring-the-line/?guccounter=1.

59. "Airpods 3: Time to Buy?". 2021. *Macrumors*. https://www.macrumors.com/roundup/airpods/.

60. Murphy Kelly, Samantha. 2021. "How Airpods Became Apple's Hottest Product". *CNN*. https://edition.cnn.com/2021/10/19/tech/airpods-3/index.html.

61. Suplizio, Aaron. 2021. "Apple Airpods Satisfaction at a Remarkable 98% For Customers". *Experian*. https://www.experian.com/blogs/insights/2017/05/experian-airpods-survey/.

62. Hoffman, Liz, Tripp Mickle, and Peter Rudegeair. 2021. "Apple, Goldman Sachs Team Up on Credit Card Paired With iPhone". *Wall Street Journal*. https://www.wsj.com/articles/apple- goldman-sachs-team-up-on-credit-card-paired-with-iphone-11550750400.

63. Espósito, Filipe. 2021. "Apple TV+ Had Only 3% Market Share in The US Last Quarter, Netflix Still in First Place". *9 To 5 Mac*. https://9to5mac.com/2021/01/20/apple-tv-had-only-3- market-share-in-the-us-last-quarter-netflix-still-in-first-place/.

Case Analysis

"Galaxy Watch4". 2021. *Samsung Electronics America*. https://www.samsung.com/us/watches/galaxy-watch4/buy/?modelCode=SM-R860NZSAXAA.

Barney, Jay B. 1986. "Organizational Culture: Can It Be A Source Of Sustained Competitive Advantage?". *The Academy of Management Review* 11 (3): 656-665.

Barney, Jay B. 1989. "Asset Stocks And Sustained Competitive Advantage: A Comment". *Management Science* 35 (12): 1511-1513.

Barney, Jay B. 1991. "Firm Resources And Sustained Competitive Advantage". *Journal Of Management* 17 (1): 99-120.

Bass, Bernard M. 1985. *Leadership And Performance Beyond Expectations*. 6th ed. New York: Free Press.

Besanko, David, and Ronald **Braeutigam**. 2013. *Microeconomic*. 5th ed. New York: Wiley.

Besanko, David, David **Dranove**, Mark **Shanley**, and Scott **Schaefer**. 1996. *Economics Of Strategy*. 1st ed. New York: Wiley.

Bower, Joseph L., and Clayton M. **Christensen**. 1995. "Disruptive Technologies: Catching The Wave". *Harvard Business Review* 73 (1): 43-53.

Burns, James McGregor. 1978. *Leadership*. 1st ed. New York: Harper & Row.

Caves, Richard E. 1984. "Economic Analysis And The Quest For Competitive Advantage". *American Economic Association* 74 (2): 127-132.

Christensen, Clayton M. 1997. *The Innovator's Dilemma*. 1st ed. Boston: Harvard Business School.

Christensen, Clayton M., Michael E. **Raynor**, and Rory **McDonald**. 2013. "What Is Disruptive Innovation?". *Harvard Business Review*, no. December 2015: 44-53.

Cool, Karel, Luís Almeida **Costa**, and Ingemar **Dierickx**. 2006. *Handbook Of Strategy And Management*. 1st ed. London: Sage.

Costa, Luís Almeida, Karel **Cool**, and Ingemar **Dierickx**. 2002. "The Competitive Implications of The Deployment Of Unique Resources". *Strategic Management Journal* 34 (4): 445-463.

Danneels, Erwin. 2008. "Organizational Antecedents Of Second-Order Competences". *Strategic Management Journal* 29 (5): 519-543.

Day, George S. 1994. "The Capabilities of Market-Driven Organizations." *Journal of Marketing* 58 (4): 37–52.

Dierickx, Ingemar, and Karel **Cool**. 1989. "Asset Stock Accumulation And Sustainability Of Competitive Advantage". *Management Science* 35 (12): 1504-1511.

Eaton, B. Curtis, and Richard G. **Lipsey**. 1981. "Capital, Commitment, and Entry Equilibrium." *The Bell Journal of Economics* 12 (2): 593–604.

Eckhardt, Jonathan T., and Scott A. **Shane**. 2003. "Opportunities And Entrepreneurship". *Journal Of Management* 29 (3): 333-349.

Foss, Nicolai J., and Thorbjorn **Knudsen**. 2003. "The Resource-Based Tangle: Towards A Sustainable Explanation Ofcompetitive Advantage". *Managerial And Decision Economics* 24 (4): 291-307.

Gilbert, Richard J., and Carmen **Matutes**. 1993. "Product Line Rivalry with Brand

Differentiation." *The Journal of Industrial Economics* 41 (3): 223–240.

Henderson, Rebecca, and Will **Mitchel**. 1997. "The Interactions Of Organizational And Competitive Influences On Strategy And Performance". *Strategic Management Journal* 18 (1): 5-14.

Jaworski, Bernard J., and Ajay K. **Kohli**. 1993. "Market Orientation: Antecedents And Consequences". *Journal Of Marketing* 57 (3): 53-70.

Ketchen, Dave, and Jeremy **Short**. 2013. *Mastering Strategic Management*. 1st ed. Boston: FlatWorld.

Lee, Tom, and Louis L. **Wilde**. 1980. "Market Structure and Innovation: A Reformulation". *The Quarterly Journal Of Economics* 94 (2): 429-436.

Mahoney, Joseph T., and J. Rajendran **Pandian**. 1992. "The Resource-Based View Within The Conversation Of Strategic Management". *Strategic Management Journal* 13 (5): 363-380.

Makadok, Richard, and Jay B. **Barney**. 2001. "Strategic Factor Market Intelligence: An Application Of Information Economics To Strategy Formulation And Competitor Intelligence". *Management Science* 47 (12): 1621-1638.

Makadok, Richard. 2001. "Toward A Synthesis Of The Resource-Based And Dynamic-Capability Views Of Rent Creation". *Strategic Management Journal* 22 (5): 387-401.

Makadok, Richard. 2010. "The Interaction Effect Of Rivalry Restraint And Competitive Advantage On Profit: Why The Whole Is Less Than The Sum Of The Parts". *Management Science* 56 (2): 356-372.

Markides, Constantinos. 2006. "Disruptive Innovation: In Need Of Better Theory". *Product Innovation Management*, no. 23: 19-25.

Peteraf, Margaret A., and Jay B. **Barney**. 2003. "Unraveling The Resource-Based Tangle". *Managerial And Decision Economics* 24 (4): 309-323.

Porter, Michael E. 1980. *Competitive Strategy: Techniques For Analyzing Industries And*

Competitors. 1st ed. New York: Free Press.

Porter, Michael E. 1985. *Competitive Advantage - Creating And Sustaining Superior Performance*. 1st ed. Toronto: The Free Press.

Spence, A. Michael. 1979. "Investment Strategy and Growth in a New Market." *The Bell Journal of Economics* 10 (1): 1–19.

A Work Project presented as part of the requirements for the Award of a Master's Degree in Management from the Nova School of Business and Economics.

Apple and the Personal Computer Business in 2021

Ana Sofia Ferreira e Cunha

Work project carried out under the supervision of:

Professor Luís Almeida Costa

17.12.2021

Abstract

The first part of this report presents the case study "Competitive Position of Apple Inc. in 2021", which describes Apple's current overall business situation, with emphasis on the iPhone. Following the guidelines of this Field Lab, both an industry and a company analysis were performed by applying the literature review concepts, while studying the disruptive innovation linked to Apple. So far, Apple's current strategy is not sustainable in the long run due to both high dependence on one product and to the deviation of consumer's brand perception.

The second section entails the individual paper "Apple and the Personal Computer Business in 2021", focusing on the famous Mac line and recent M1 chip. Following the guidelines of this Field Lab, both an industry and a company analysis were performed by applying the literature review concepts, confirming Apple's competitive advantage in the personal computer industry.

This thesis uses publicly available information until the 30th of September 2021. Any changes concerning product introductions or financial figures after this reference date are not considered.

Keywords: Strategy; Company Analysis; Competitive Advantage; Disruptive Innovation; Apple; Tim Cook; iPhone; PC; M1 Chip

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Personal Computer Industry

Market

Personal computer worldwide sales sank, from 365.36 million units shipped in 2011, to 262.55 million in 2019, supplanted by smartphones. Nonetheless, in 2020 this trend was reverted, and PC sales surged by 4,8% to 275.15 million, fuelled by the COVID-19, as older PCs were not fully equipped for remote activities. In the first quarter of 2021, the fastest year-on-year growth of the century was registered: PC sales skyrocketed by 32% to 69.87 million units shipped. Howbeit, such growth had a pandemic-constrained market as a comparison and some of those shipments corresponded to 2020 delayed shipments, due to locked factories and component shortages. The growth pattern continued along the second and third quarters, yet at a slower pace, with 71.63 and 84.15 million units, an increase of 4.58% and 1.03%, respectively. (Statista 2021) The global PC industry is predicted to grow from $145.73 billion in 2020 to $161.19 billion in 2021, through a Compound Annual Growth Rate of 11.1%. (Business Wire 2021) The PC industry is segmented by product into desktops, laptops, tablets, monitors and projectors, keyboards, printers and copiers, and storage units, and by application into personal end-users, commercial and industrial. Whereas storage units lead the market in terms of volume, with close to 2.9 billion pieces in 2020 (Statista 2021), laptops generated most of the industry revenue in 2020, almost $122.9 billion. (Statista 2021) While the preference for non-portable desktops shrank by 15,10%, laptops' shipments rocketed 28,61%, from 2019 to 2020, and are forecasted to further grow 24,40% from 2020 to 2021, being the uttermost beneficiary of the pandemic. (Statista 2021) Upsurge demand for Chromebooks, a popular affordable laptop among students, was registered. However, as schools reopened, Chromebook's sales slumped, yet remained above pre-pandemic levels. Hence, as the pandemic fades away from its critical status, demand is shifting to the commercial segment, led by the economic recovery and the return to presential offices, anticipating a recovery for the desktop segment. (Poletti 2020)

Competitive Landscape

Structured as an oligopoly market, the fierce personal computer industry is highly concentrated. In 2020, Chinese Lenovo led the market with a 24% share, followed by American HP and Dell, with 22.4% and 16.6%, respectively. Apple's 7.6% ensured fourth place, close to Acer's 6.9% market share. Therefore, the five firms combined had 77,5% of the market, while in 2013, the same firms held just 58.8%. (Statista 2021) In 2021, the top PC vendors remained unchanged. In the first quarter, appraisals go to Lenovo's 42.3% year-over-year growth, due to its considerable in-house manufacturing and more supply chain control, and Apple's astounding 48.6% YoY growth, nourished by the M1 chip. During the third quarter, Lenovo sustained its leading position, with a steady 23.7% market share. HP remained second with 20.9%, yet with a 7.1% YoY decline, driven by the decreasing Chromebook demand. The demand swift from personal to commercial segments guaranteed Dell a share of 18.1%, through a YoY growth of 24.83%. Again, Apple was placed fourth and Acer fifth with 8.6% and 7.2% market shares. (Statista 2021)

As the industry enters a stage of maturity, companies upscale their R&D expenditure to improve their competitiveness. Apple dominates with massive investments of $18.75 billion in 2020 and predicted $21.91 billion in 2021. The M1 chip stands out as the main output, offering peerless power-efficiency performance, while putting an end to Intel's dependence. In opposition, Microsoft has launched Windows 11 to equip Lenovo, HP, Dell, and Acer computers. (Statista 2021) Apple's high R&D investment reflects its differentiation strategy and positioning among the premium consumer segment. For instance, in 2021, Apple ranks similarly to Dell regarding revenue, while it presents half of Dell's units shipped, disclosing Apple's premium prices. Other companies comprise a wider variety of products targeted at broader customer segments entailed in the mass market. Lenovo and Acer tend to focus on the low and mid-range segments, whereas HP and Dell aim for the mid-range and high segments. (Statista 2021)

Porter's Five Forces

To better understand the competitive rivalry and attractiveness of the market, a Porter's Five Forces analysis was conducted on the global PC industry. (Porter 1979)

The threat of new entrants is low. The PC industry is highly concentrated with the top five firms controlling 77.5% of the market with close market shares. Evidently, the presence of such dominant household names deters the entry of new players. Massive capital investment to establish a new firm and to compete with experts is required. Considering that Apple spends $21.91 billion on R&D, hardly any can fight back. In addition, well-established companies have set strong supply chains and distribution channels as entry barriers. As the PC industry matures, differentiation tends to decrease, and customers become more price sensitive. Effective economies of scale are pivotal to lower costs, yet they require intensive capital investment.

Overall, the bargaining power of suppliers is moderately high. Intel's microprocessor chips integrate 60.2% of PC devices (Statista 2021), whereas Microsoft operating systems are used in 71.6% (Statista 2021), giving both suppliers strong control over the industry. Apple stands as an exception, as the company currently develops its own processor and software. Smaller components such as peripherals are highly standardized and widely available from numerous suppliers. Hence, those switching costs are low and do not constitute an obstacle.

Buyers have moderate bargaining power as whereas organizations that buy computers in large volumes have strong collective bargaining power, the individual buyer is a weak force. Ease of information access enabled customers to promptly compare different products, which led to an easy shift among brands. As most PC users perceive them as very similar, they tend to choose primarily on price. Consequently, PC manufacturers are hefty investing in R&D to develop high-quality and innovative products and cultivate brand loyalty.

The threat of substitute products is moderately low, with smartphones, increasingly functioning like computers, as the main substitute. Besides being portable, smartphones can be used in

diverse environmental settings. However, the small display is not comfortable to perform long and exhausting tasks. The PC will continue to be a necessity, as it once became a substitute for products such as TV, newspaper, books, videogame, photo albums, or word-processor.

Finally, rivalry among existing firms is high. Differentiation has become more difficult in the mature PC industry, with PC standardization provoking a slow shift of costs. As a result, competition is focused on pricing instead of product differentiation. Rivalry is fierce as players are similar in size and available capital to invest and target the same medium-range customer segment. As the PC industry growth is decelerating, the urge for differentiation became more severe. In fact, companies have been massively investing in R&D, with Apple standing out.

Although the threat of new entrants is low, competitive rivalry is fierce. With relatively moderate bargaining power of suppliers and buyers, as the threat of substitute products, the attractiveness of the PC industry is moderately low, as demonstrated in exhibits 1 and 2. As Porter (1979) mentioned, “strategy can be viewed as building defenses against the competitive forces or as finding positions in the industry where the forces are weakest”. Accordingly, Apple has matched its strengths, and follows a differentiation strategy, which will be further analyzed.

Apple

Apple Inc is an American multinational corporation that manufacturers personal computers, smartphones, peripherals, and software. Apple II was the first PC to achieve mass-market success in 1977 and the Macintosh introduced the modern graphical user interface to the mainstream in 1984, which then led to the state-of-the-art Mac product line of 2021.

Although iPhone is Apple's most profitable product, personal computers remain an important part of the company's business, as, combined, they are the third-largest source of revenue. In 2020, Mac recorded a $28,662 billion revenue and iPad accounted $23,724 billion, corresponding to 10,44% and 8,64% of the company’s total revenue (exhibit 3). In 2020, Apple

shipped an estimated 22.5 million Macs (Charlton 2021) and 45.5 million iPads (Nations 2021), meaning that the average price of these devices was $1,274 and $521, respectively.

Therefore, as displayed in exhibit 4, Apple positions itself as a high-quality premium brand, that provides premium products at premium prices, targeting less price-sensitive consumers. Steve Jobs confirmed by mentioning “(there) are customers we (Apple) choose not to serve. We don't know how to make a $500 computer that's not a piece of junk." (Arvidson n.d.)

Mac

Apple computers are distinguished by their minimalist aesthetic design, intuitive macOS, and seamless user experience, enriched by the Apple ecosystem. Notably, Apple’s durable personal computers have the highest satisfaction score of 82% among the PC industry. (exhibit 5)

Mac presents three portable computers: MacBook Air, MacBook Pro 13´´ and MacBook Pro 16´´, from $999, $1299, and $2399, respectively. Although MacBook Air is the Mac entry line product, with the M1 chip it does not lag behind in performance. The new MacBook Air features a 3.5 times faster CPU, 6 times faster GPUs, 9 times faster Neural Engine, and 6 more hours of battery life than its previous version, in a quiet design without a fan. On the other hand, the powerful MacBook Pro 16’’ is equipped with a 10-core CPU and features 4 times the GPU (32-core), unified memory (64GB), and maximum configurable storage (8TB) of the MacBook Air. Regarding desktops, the Mac portfolio holds four different models: iMac with 24´´and 27´´, Mac Pro, and Mac Mini. Their price ranges from $1299 and $1799 for both versions of iMac, correspondingly, $699 for the Mac Mini to $5999 for the Mac Pro. iMac 24’’ and Mac mini share some features with the MacBook Air, such as an 8-core CPU and GPU, 16GB of memory, and 2TB of configurable maximum storage. The 27-inch iMac and Mac Pro, though, still use processors from Intel, with 10-core and 28-core CPU, and AMD GPU. (Apple n.d.)

Both the growing remote work practice and the powerful-efficient M1 boosted Mac computer sales which passed the 7.2 million units’ milestone in the third quarter of 2021. (Statista 2021)

iPad

"A tablet is a highly portable PC whose primary interface is a touch screen that occupies the full length/width but whose speaker and microphone are not positioned for a hand-held calling". (Lenovo n.d.) Therefore, the iPad provides greater portability and, thus, convenience, while the high-quality display with a responsive touchscreen grants more interaction.

iPad line is composed of four different tablets: iPad, iPad mini, iPad Air, and iPad Pro, from $329, $499, $599, and $799, respectively. Whereas iPad Pro is geared with M1 chip, the remaining iPad models resort to iPhones' A13 to A15 Bionic chip. With a leading market share of 34.6% (Statista 2021), the iPad stands as a hybrid product, combining the best of the iPhone and the Mac. Due to its uniqueness, the iPad will be further analyzed by another group member.

M1 chip

Phones and computers used to live in different processors worlds, with phones equipped with Arm architecture and computers using Intel's x86 chip. While Arm was low power for complex operations, the PC market safely belonged to Intel. Intel refused to develop chips for the iPhone, which led Apple to design its own chips. With its expertise and years of R&D, in November of 2020, Apple revealed its new M1 processor to the 13-inch MacBook Pro, MacBook Air, and Mac mini models, added in May to the M1 iMac and the M1 iPad. (Cold Fusion 2020)

M1 chip is built on the industry-leading 5-nanometer process technology and, through a unified memory architecture, packs the 8-core CPU, 8-core GPU, 16-core neural engine, 16 billion transistors, thunderbolt controller, machine learning accelerators, dedicated media encoder and decoder, secure enclave, and memory into a single silicon package – system on a chip (exhibit 6). M1 chip is the most powerful and efficient chip that Apple has developed, equipped with up to 3.5x faster CPU and 6x faster GPU, while guaranteeing a battery life 2x longer than previous-generation models. The new Arm-based processor set an end for Mac's dependence on x86 Intel chips, lasting since 2006, and delivered the biggest leap ever for the Mac. (Apple 2020)

Competitive advantage

In such fierce rivalry as the PC industry, it is pivotal for Apple to develop certain strategies and accumulate unique resources to sustain a competitive advantage and outperform its peers.

According to Porter (1985), competitive advantage can be attained either through a cost leadership strategy, lowering production costs, or by a differentiation strategy, delivering products with higher perceived value and unique characteristics. Costa, Cool and Dierickx (2002), reinforce that a firm has a competitive advantage when it creates more economic value than competitors, where the economic value created is the difference between products' perceived benefits by customers and the firm's cost of production.

Cost Efficiency, Not Cost Leadership

Under cost leadership, a firm becomes the lowest-cost manufacturer in the industry, driven by technology advancements, efficient logistics, or a low-cost production base. (Porter, 1985) Apple's vertical integration strategy enables more quality control and costs reduction. Apple has full control over the manufacturing and selling process, from Mac hardware, macOS software, and Apple's web services (AppStore, iCloud, iTunes, …) development, to the retail activities in the companies' own stores. M1 chip closed the remaining gap, drastically reducing Macs' production cost. While the previous Intel's i7 processor was acquired for $200, M1 is manufactured for just $50, a saving of $150 per unit (Peterson 2020). Tim Cook drove efficiency by streamlining Apple's supply chain operations, from manufacturing to distribution processes, passing through the rationalization of warehouses. He also reduced the number of suppliers, enhancing Apple's bargaining power. Even so, Apple continues to rely on affordable Asian manufacturers, namely Foxconn, where production costs such as labor and materials are significantly lower. (Mark Milian 2012).

Notwithstanding, Apple is a customer-centric company, whose high-end products prioritize innovation and user experience, over cost and price, as its massive R&D investments unveil.

Differentiation

On the other hand, in differentiation a company seeks to be unique in its industry along dimensions that are widely valued by their customers (Porter, 1985). As previously mentioned, several factors have differentiated Macs from the competition, such as the elegant design, premium branding, high-quality bundled software, user-friendly interface, and dedicated customer service. However, the recent M1 chip marks a new chapter in Apple's differentiation strategy in the PC industry, constituting a strong source of competitive advantage.

Usually, computers have multiple chips, each with a particular job. In M1 (system on a chip), the distance traveled by data between each component is extremely lower, reducing latency. CPU and GPU can access data from the RAM at the same time, without having to copy it back and forth as conventional x86 computers do. Notably, M1 delivers the World's Best CPU Performance per Watt and the World's Fastest Integrated Graphics in a computer, providing the double CPU and GPU performances of the ordinary PC, using just a quarter (exhibit 7) and a third of the power (exhibit 8). Hence, during the M1 MacBooks' announcement, Apple claimed they were faster than 98% of laptops sold in the previous year. (CNET Highlights 2020)

In addition, due to the shared architecture, M1 enables impressive app compatibility. Now, Mac can perfectly run iPhone and iPad apps, with the familiarly associated responsiveness. Apple was already distinguished by its peerless ecosystem, referred to the seamless connectivity of the brand's devices. M1 empowered the ecosystem, erasing even more the boundaries between equipments. From swift media transfer with AirDrop, to having iPhone activities such as iMessage or FaceTime on Mac, to asking Siri for an Apple Music playlist for any of Apple's devices, the hypotheses are numerous, taking the user experience to a whole new level. Notwithstanding, synergies transcend the ecosystem. As the M1 uses a different architecture than common computers, Apple built tools that allow developers to create Universal app binaries that run natively on both Apple Silicon and Intel chips, containing executable code for

both architectures. Furthermore, Apple developed the Rosetta 2 translation layer that enables x86 apps to run similarly on both Intel and M1, to offer the best of both worlds. (Apple n.d.) The macOS, perceived as more intuitive, constitutes a major differentiator of Apple's computers, as Jobs described them as "software wrapped in a beautiful package" (Block 2007) Through a complete vertical integration, Apple manufactures its own chip (processor), on its own equipment (hardware), under its own operating system (software), complemented with its own services. As a result, all components work seamlessly together. Such ultimate coordination level allows to maximize the full potential of Mac devices. Further, the full control on the product with M1 represents an opportunity to scale up, as and when desired, without depending on third parties. Moreover, Apple computers guarantee a superior security level. Through a threat intelligence process set up with software notarization, Gatekeeper, XProtect, and Malware Removal Tool, it promptly identifies and blocks malware (Apple 2021). Also, M1 has a built-in Secure Enclave that manages Touch ID and a more secure storage controller with AES encryption to protect user data. (Linkento 2021)

Sustained Competitive Advantage

Jay Barney defined sustained competitive advantage (SCA) as a value creating strategy that is not simultaneously being implemented by any competitor and when other firms are unable to duplicate the benefits of this strategy. He added that unique firm-specific resources can be a source of SCA if, according to the Resource-Based View, they have four attributes: value, rarity, imperfectly imitability and non-substitutability. (Barney 1991)

As exposed over this case-study, the value of the Mac is undeniable, especially after the M1 introduction. The potent M1 chip, the intuitive macOS and the harmonious ecosystem are resources proven to deliver significant value to the user, while Apple, as sole proprietary, has and will continue to have exclusive access, marking their rarity. Those unique resources are the result of Apple's superb vertical integration of in-house hardware, software, applications and

services, which is incredibly hard to duplicate, due to the comprehensive expertise and massive capital requirements. Moreover, Apple's technology is protected from competition through legal isolating mechanisms. There are no strategically equivalent resources currently available, neither incentives for an individual PC company to leave Intel and Windows to develop its own processor and operating system to then grow a network of users sizable enough to deliver value. Furthermore, they would have to develop varied devices, instead of a stand-alone product, to compete with Apple's constellation of products.

In abridgement, the power-efficiency of the new M1 chip, the refined macOS and the unique Apple ecosystem, now enriched by the M1, are the unique resources that differentiate the Mac and grant Apple a sustained competitive advantage in the fierce personal computer industry. It is important to highlight that the solid Apple brand, recognized by its with high-quality and user-friendly products, also constitutes an extremely hard to imitate competitive advantage.

Conclusion

Apple mitigates the fierce rivalry by not playing the PC industry's price competition game. Instead, Apple pursues a differentiation strategy to maintain a competitive edge. Mainly because of the unique user experience sustained by the ecosystem, premium prices are justified and fund further innovations, reaching a virtuous circle. (Heracleous 2013)

Apple was always recognized for its market intelligence, related to the present and future needs of customers, the distribution of these knowledge and the organization's adequate responsiveness to the market, known as market sensing capabilities. (Jaworski and Kohli 1993) They are essential to sustain an organization's SCA, enabling them to readily identify opportunities and threats and respond promptly. The M1 chip is another example of this Apple's capability, addressing technical issues of the previous processors such as power heating and consumption, while doubling both CPU and GPU performances. However, the M1 leap is not

limited to technical advancements, but also improves the entire user experience at a time when, due to the pandemic, we are using the computer for remote activities more than ever. The Mac has finally integrated Apple Silicon with perfect app compatibility, eroding the physical limits of different Apple devices, and making operations between them increasingly smooth, bridging the remaining gap. Simultaneously, the M1 chip marked the end of an era of dependence on Intel and marks the beginning of many opportunities for scale up innovations, resorting to Machine learning and Artificial Intelligence, for example.

Steve Jobs believed that vertical integration was essential to create a great user experience, (T. Lee 2015) which set the foundation for the unique and seamless Apple ecosystem. The Mac, with the M1 chip processor, became the recent pivot of this vertical integration strategy, further enriching the ecosystem and making it harder for competitors to catch up. In fact, Apple devices do not work that seamlessly with other brands' devices, since Apple develops its products specifically for its proprietary ecosystem, which creates a high switching cost that favours retention. Hence, the consumer will opt for another Apple complementary device to reap additional synergies between them and enhance even more the customer experience, creating a halo effect. And the soon users notice, they are entrenched and locked into Apple's ecosystem. Ultimately, Apple's ecosystem, enabled by Apple's vertical integration, is the core of the company's strategy. The aura of its brand and the lure of its ecosystem puts Apple in a powerful position, with a non-imitable competitive advantage. (Markman 2017)

Competitive advantage should have thought of like a stool, with at least three legs. Yet, as mentioned on the group report, Apple is too dependent on the iPhone. Nonetheless, the recent M1 chip development constitutes a competitive edge for the Mac, which, along with the recent investment on the wearables and services might sustain Apple's overall competitive advantage.

References

Apple. 2020. *Apple unleashes M1*. 10 November. Accessed December 16, 2021. https://www.apple.com/pt/newsroom/2020/11/apple-unleashes-m1/.

—. n.d. *Building a Universal macOS Binary.* Accessed December 16, 2021. https://developer.apple.com/documentation/apple-silicon/building-a-universal-macos- binary.

—. 2021. *Protecting against malware in macOS.* 18 February. Accessed December 16, 2021. https://support.apple.com/pt-pt/guide/security/sec469d47bd8/web.

—. n.d. *Which Mac is right for you?* Accessed December 16, 2021. https://www.apple.com/mac/.

Arvidson, Erik. n.d. *Target Audience for Mac or Apple Computers.* Accessed December 16, 2021. https://www.techwalla.com/articles/target-audience-for-mac-or-apple- computers.

Barney, Jay. 1991. "Firm Resources and Sustained Competitive Advantage." *Journal of Management* 99-120.

Block, R. 2007. *Steve Jobs live from D 2007.* 30 May. Accessed December 16, 2021. https://www.engadget.com/2007-05-30-steve-jobs-live-from-d-2007.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLnB0Lw&guce_referrer_sig=AQAAAIGjFYz53s8O4aOBlNBIqH5ONjwJdajxwpQD4M5S3aF1EpjyWmXwZeXItq7nAjy4o2ca2WMBq08at2b92Yr1KKXvMBUNG76ZGZyvEPCvY H.

Business Wire. 2021. *Global Personal Computers Market Report (2021 to 2030) - COVID-19 Impact and Recovery - ResearchAndMarkets.com.* 23 June. Accessed December 16, 2021. https://www.businesswire.com/news/home/20210623005540/en/Global- Personal-Computers-

Market-Report-2021-to-2030---COVID-19-Impact-and-Recovery---ResearchAndMarkets.com.

Charlton, Hartley. 2021. *Mac Sales Skyrocketing After M1 Launch.* 19 January. Accessed December 16, 2021. https://www.macrumors.com/2021/01/19/mac-sales-skyrocketing- after-m1-launch/.

CNET Highlights. 2020. *Apple silicon M1 chip REVEALED! (Full Mac presentation).* 10 November. Accessed December 16, 2021. https://www.youtube.com/watch?v=dSA2lCyP1e8.

Cold Fusion. 2020. *How Apple Just Changed the Entire Industry (M1 Chip).* 23 November. Accessed December 16, 2021. https://www.youtube.com/watch?v=OuF9weSkS68.

Costa, Luís Almeida, Karel Cool, and Ingemar Dierickx. 2002. "The Competitive Implications of The Deployment Of Unique Resources." *Strategic Management Journal* 445-463.

Heracleous, Loizos. 2013. "QUANTUM STRATEGY AT APPLE INC." *Organizational Dynamics.*

Jaworski, Bernard, and Ajay Kohli. 1993. "Market Orientation: Antecedents and Consequences." *Journal of Marketing* 53-70.

Lee, Timothy B. 2015. *How Apple became the world's most valuable company.* 9 September. Accessed December 16, 2021. https://www.vox.com/2014/11/17/18076360/apple.

Lee, Timothy. 2015. *How Apple became the world's most valuable company.* 9 September. Accessed December 16, 2021. https://www.vox.com/2014/11/17/18076360/apple.

Lenovo. n.d. *What is a tablet PC?* Accessed December 16, 2021. https://www.lenovo.com/lk/en/faqs/laptop-faqs/what-is-a-tablet-pc/.

Linkento. 2021. *Why is Apple's M1 chip so important?* 29 July. Accessed December 16, 2021.

https://fuentitech.com/why-is-apples-m1-chip-so-important/159956/.

Mark Milian. 2012. *How Apple cuts costs in building its gadgets.* 7 February. Accessed December 16, 2021. https://edition.cnn.com/2012/02/06/tech/gaming-gadgets/apple- supply-chain/index.html.

Markman, Jon. 2017. *Apple Growths Its Ecosystem and Its Advantage.* 12 April. Accessed December 12, 2021. https://www.forbes.com/sites/jonmarkman/2017/04/12/apple- grows-its-ecosystem-and-its-advantage/?sh=56dd58c85b4d.

Nations, Daniel. 2021. *How Many iPads Have Been Sold?* 3 March. Accessed December 16, 2021. https://www.lifewire.com/how-many-ipads-sold-1994296.

Peterson, Mike. 2020. *Apple may be saving billions in component costs by switching to M1 Mac.* 18 November. Accessed December 16, 2021. https://appleinsider.com/articles/20/11/18/apple-may-be-saving-billions-in- component-costs-by-switching-to-m1-mac.

Poletti, Therese. 2020. *The pandemic has brought the personal computer back to life, with help from Zoom.* 8 September. Accessed December 16, 2021. https://www.marketwatch.com/story/the-pandemic-has-brought-the-personal- computer-back-to-life-with-help-from-zoom-11599316207.

Porter, Michael E. 1985. *Competitive Advantage - Creating And Sustaining Superior Performance.* Toronto: The Free Press.

Porter, Michael E. 1979. "How Competitive Forces Shape Strategy." *Magazine* 137-145.

Statista. 2021. *Apple Inc's expenditure on research and development from fiscal year 2007 to 2021.* 22 November. Accessed December 16, 2021. https://www-statista- com.eu1.proxy.openathens.net/statistics/273006/apple-expenses-for-research-and-

development/.

—. 2021. *Computer hardware revenue in worldwide from 2012 to 2025, by segment.* 20 July. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/forecasts/1250729/revenue-segments-computer- hardware-worldwide.

—. 2021. *Computer hardware volume worldwide from 2012 to 2025, by segment.* 21 July. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/forecasts/1250747/sales-volume-segments-computer-hardware-worldwide.

—. 2021. *Distribution of Intel and AMD x86 computer central processing units (CPUs) worldwide from 2012 to 2021, by quarter*. 28 October. Accessed December 16, 2021. https://www.statista.com/statistics/735904/worldwide-x86-intel-amd-market-share/.

—. 2021. *Global unit sales/shipments of Apple Mac computers from 1st quarter 2006 to 3rd quarter 2021*. 24 November. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/statistics/263444/sales-of-apple-mac-computers-since- first-quarter-2006/.

—. 2021. *Market share held by the leading computer (desktop/tablet/console) operating systems worldwide from January 2012 to September 2021.* 4 October. Accessed December 16, 2021. https://www-statista- com.eu1.proxy.openathens.net/statistics/268237/global-market-share-held-by- operating-systems-since-2009/.

—. 2021. *Market share of personal computer (PC) shipments worldwide from 2013 to 2020, by vendor.* 11 January. Accessed December 16, 2021. https://www-statista- com.eu1.proxy.openathens.net/statistics/534914/worldwide-pc-shipment-share-by-vendor/.

—. 2021. *Notebook, desktop PC, and tablet shipments worldwide from 2010 to 2025.* 23 November. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/statistics/272595/global-shipments-forecast-for-tablets-laptops-and-desktop-pcs/.

—. 2021. *Personal computer (PC) unit shipments worldwide from 2009 to 2021, by quarter.* 1 November. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/statistics/264467/global-pc-shipments-since-1st- quarter-2009/.

—. 2021. *Personal computer (PC) vendor shipment share worldwide from 2011 to 2021, by quarter.* 23 November. Accessed December 16, 2021. https://www-statista- com.eu1.proxy.openathens.net/statistics/269703/global-market-share-held-by-pc-vendors-since-the-1st-quarter-2009/.

—. 2021. *Share of personal computer (PC) market revenue by vendor worldwide from 2018 to 2021.* 27 August. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/statistics/541286/worldwide-pc-market-vendor-share/.

—. 2021. *Tablet shipments market share by vendor worldwide from 2nd quarter 2011 to 3rd quarter 2021*.* 24 November. Accessed December 16, 2021. https://www-statista-com.eu1.proxy.openathens.net/statistics/276635/market-share-held-by-tablet-vendors/.

Appendixes

Exhibit 1: Porter's Five Forces on the Personal Computer Industry (Diagram).

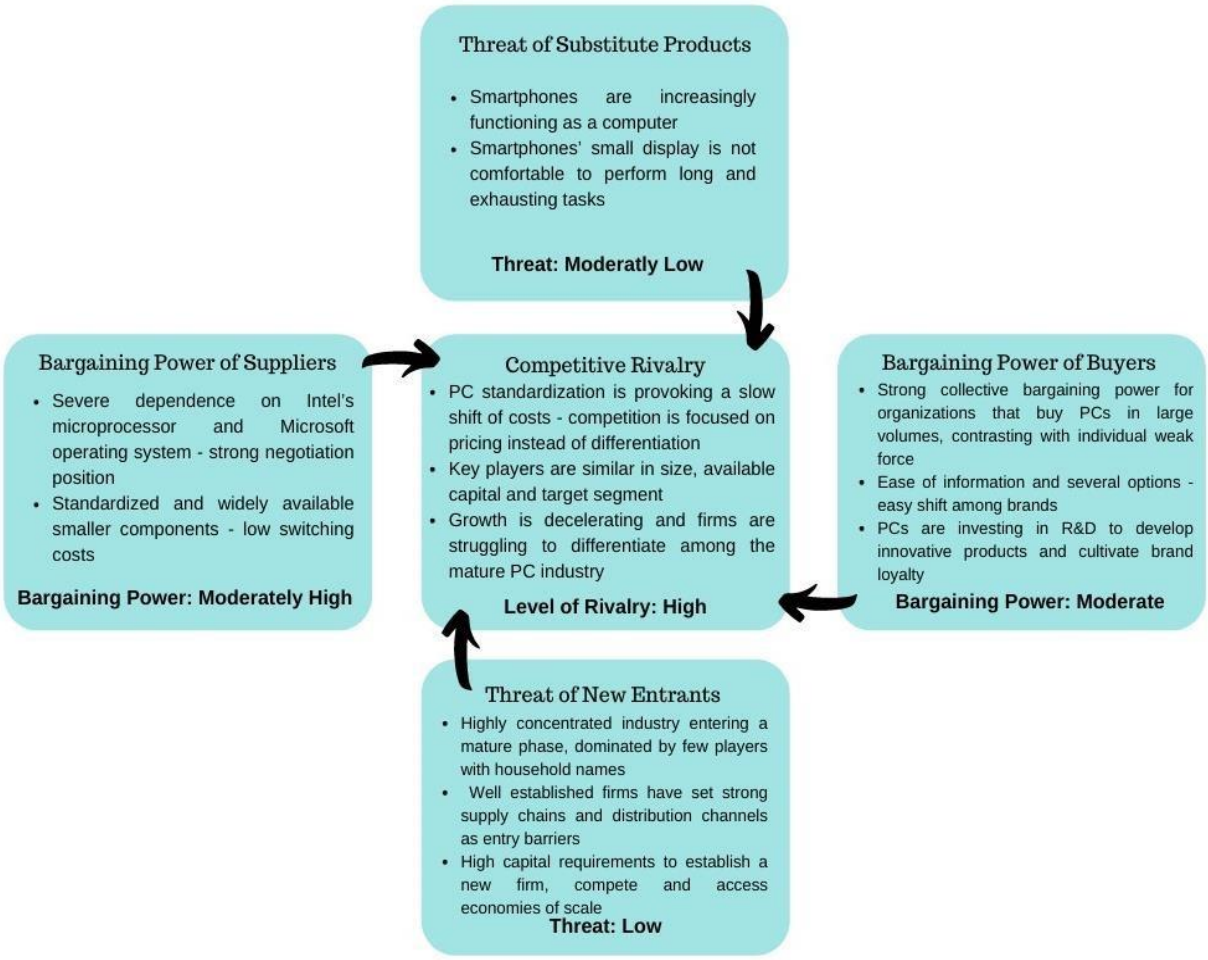


Exhibit 2: Porter's Five Forces on the Personal Computer Industry (Graph).

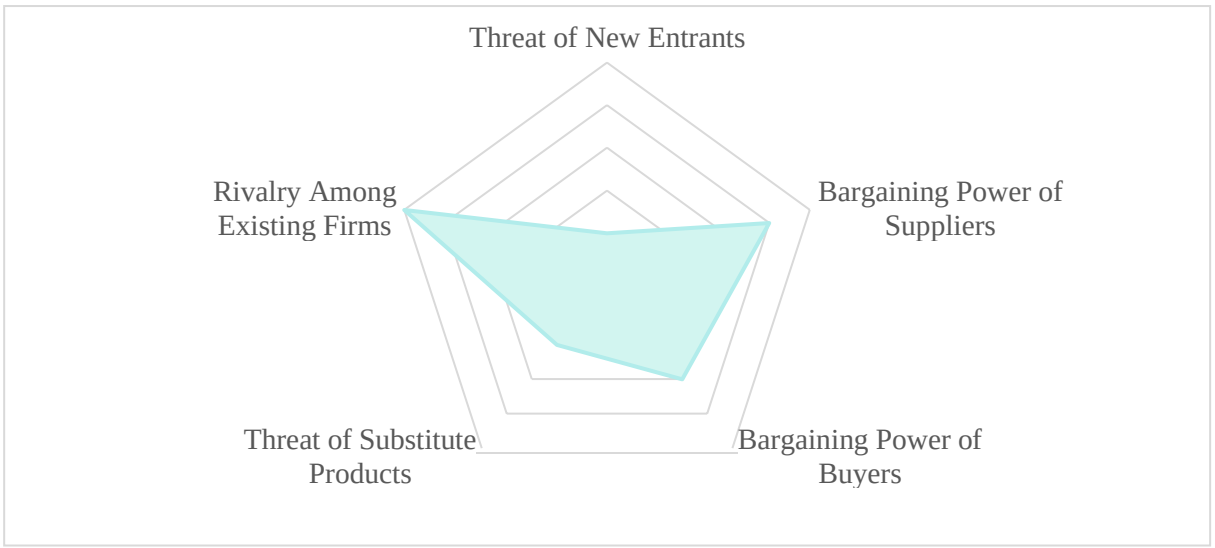


Exhibit 3: Disaggregated Revenues by Apple's significant Products and Services.

		Revenues (billion dollars)		
		2020	2019	2018
Product	iPhone	137,781	142,381	164,888
	Mac	28,662	25,740	25,198
	iPad	23,724	21,280	18,380
	Wearables, Home and Accessories	30,620	24,482	17,381
	Services	53,768	46,291	39,748
	Total Net Sales	$ 274,515	$ 260,174	$ 265,595

Source: *Apple Investor Relations.*

Exhibit 4: Positioning Map of the Personal Computer Market (Key Players).

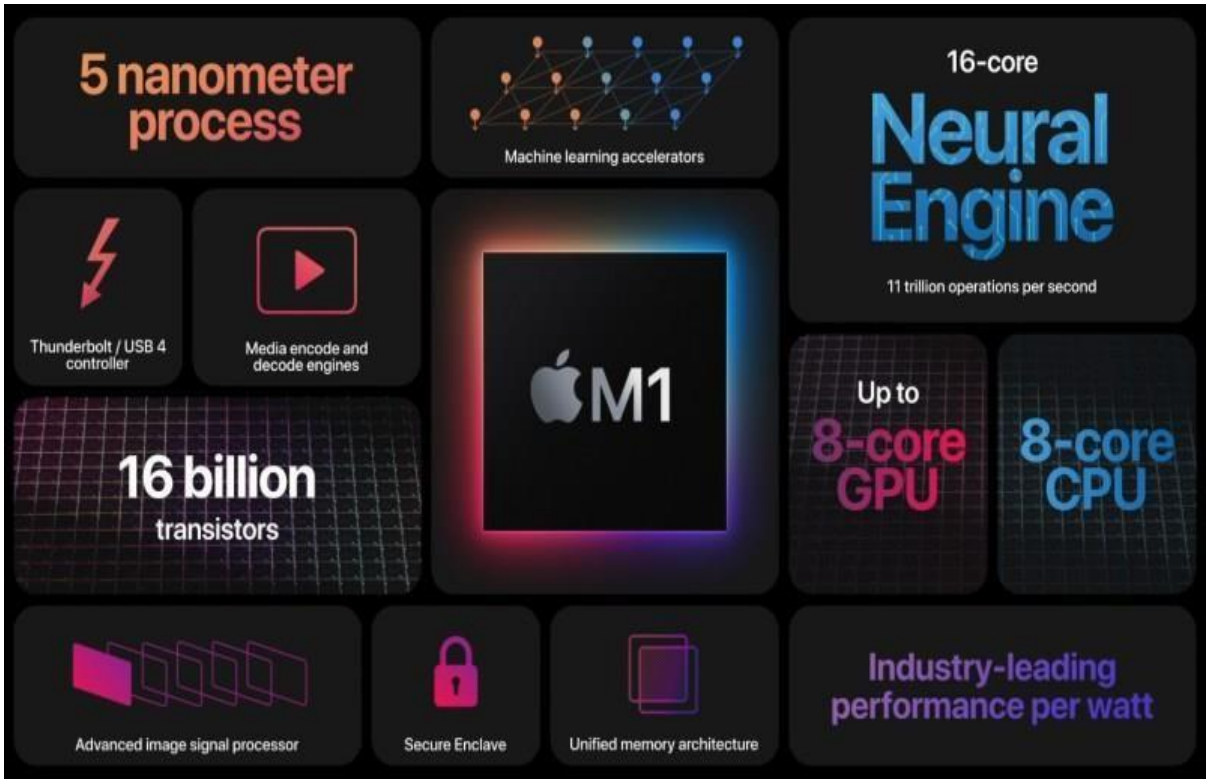
Exhibit 5: Household appliances & electronic study regarding the satisfaction of consumers with personal computers.

American Customer Satisfaction Index: Personal Computers			
Company	**2019**	**2020**	**% Change**
Apple	83	82	-1
Samsung	81	81	0
Acer	77	78	1
Amazon	79	78	-1
ASUS	76	77	1
Dell	77	77	0
HP	78	77	-1
Lenovo	74	76	3
Others	77	75	-3

0 - 100 Scale

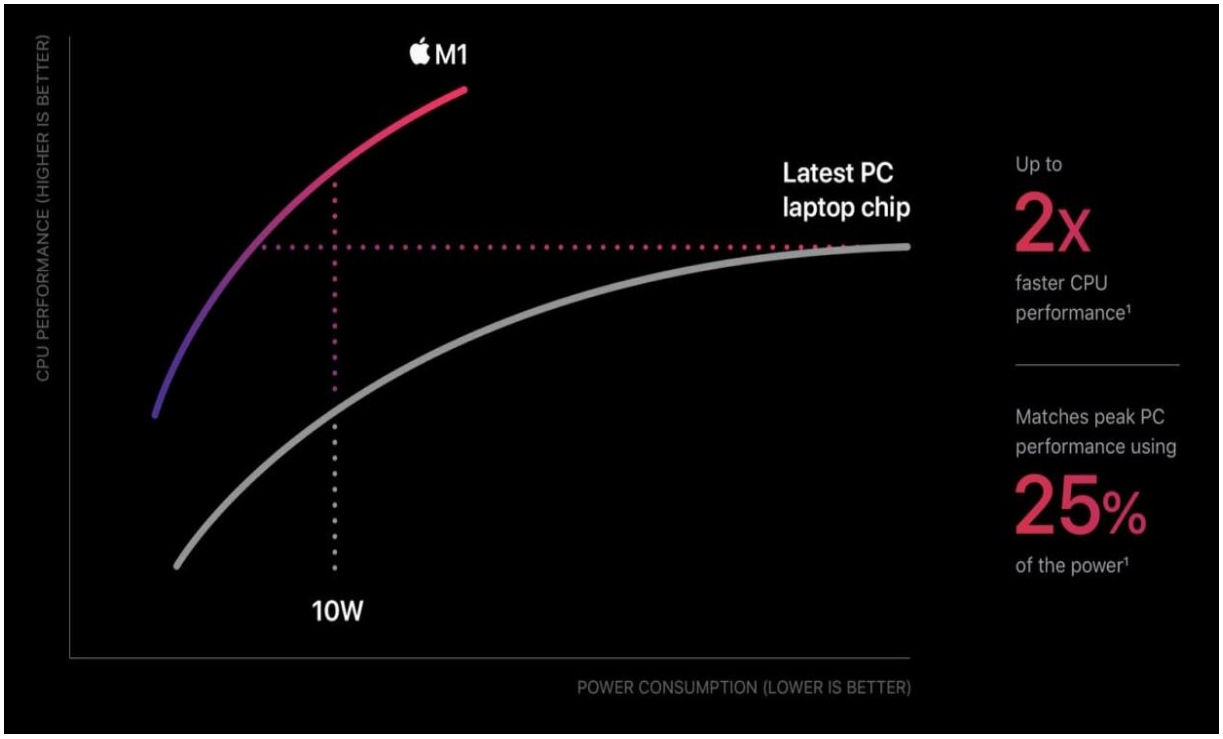
Source: *American Customer Satisfaction Index.*

Exhibit 6: Apple's M1 chip – System-On-a-Chip.



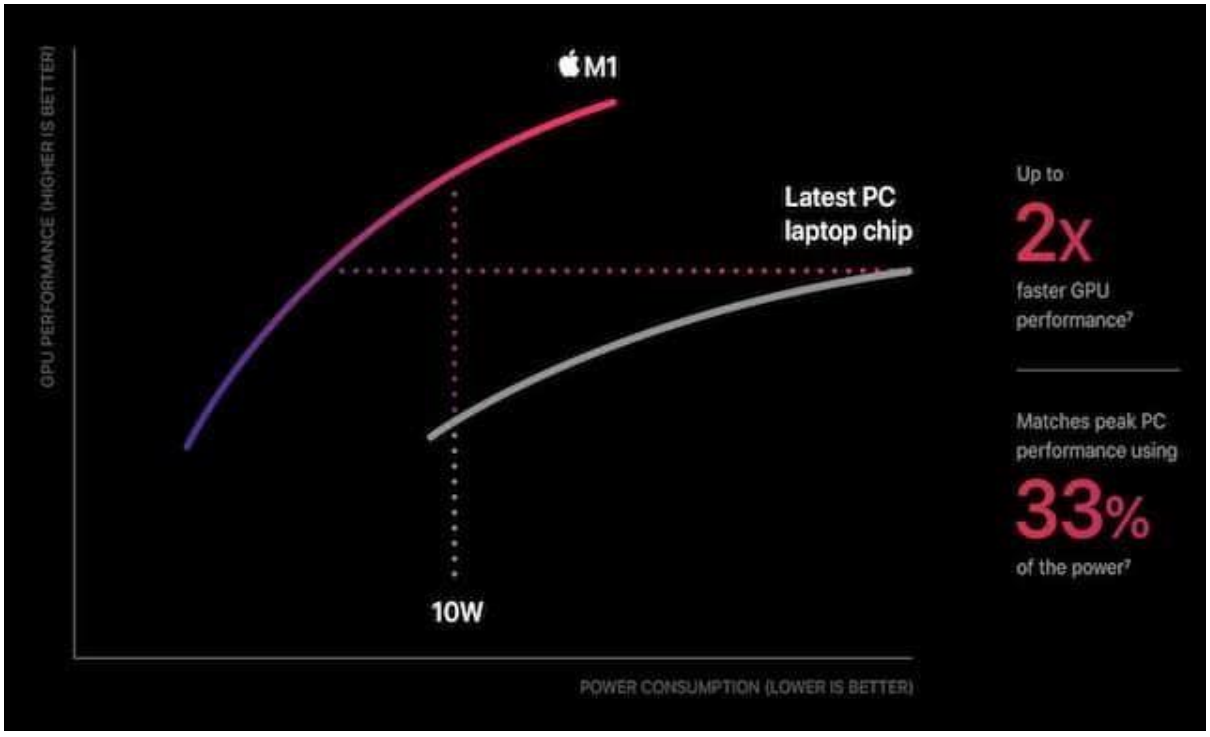
Source: *Apple*

Exhibit 7: M1 CPU Performance per Watt.



Source: *Apple*

Exhibit 8: M1 GPU Performance per Watt.



Source: *Apple*