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# Apple Inc. in 2020

After almost a decade as CEO, Tim Cook could look back at his record at Apple with enormous pride. During his tenure, Apple became the world's first trillion dollar market cap company. The firm's iconic iPhone has grown almost 5X under Cook, while Apple introduced new hardware products, such as the Apple Watch and AirPods (see **Exhibits 1a, 1b, 1c** and **2** for Apple financials and stock price).

Yet 2020 could be a defining year for Apple and Cook. Apple's core hardware businesses had slowed dramatically or declined in the last several years. iPhones, iPads and Macs had become mature products, with sales largely driven by user upgrades. A new generation of phones, using 5G technologies, might stimulate iPhone replacement demand, but the rollout was expected to be slow. Emerging markets also offered some hope for growth, but most Apple products were perceived as too expensive for many lower income countries. Finally, China had been one of the bright spots for Apple in the prior five years, but it, too, showed signs of strain. The combination of a Trump-led trade war and the coronavirus pandemic put a serious damper on Apple's prospects in China.

Seeing the writing on the wall, Cook prepared Apple for one of its largest strategic shifts in more than a decade. While hardware sales would still be critical, Cook was betting that Apple could become a major force in technology-related services. Apple's installed base of iPhone users exceeded one billion people in early 2020.[1] This gave Apple a unique opportunity to cross-sell services to existing, loyal customers. Ranging from insurance (Apple Care) and music (Apple Music) to payments (Apple Pay), video content (Apple TV+), gaming (Apple Arcade) and news subscriptions (Apple News+), Cook was hoping to catapult the company into its next phase of growth. Indeed, Apple reported a $50 billion run-rate for services in Q4, 2019 – almost 20% of gross revenue.

Services were a big opportunity for Apple, but so were Cook's challenges. First, the company's profits and valuation heavily depended on the iPhone and other hardware. The COVID-19 pandemic would severely dampen demand in the short run. And in the longer run, Cook pondered whether growing sales of Apple Watch and AirPods could compensate for stagnating sales in other categories. What actions were open to Cook to improve hardware volumes and margins? Second, it might seem obvious that Apple had a built-in customer base for services, but pushing hardware vs. pushing services involved trade-offs. Should Apple be a 'hardware-first' company or a 'service-first' company? Should it enable Apple services on everyone's hardware (for example, like Netflix), or tie services to

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grow Apple hardware? Moreover, what made Apple's services distinct? Apple Music was very similar to Spotify; Apple TV+ had a similar strategy to Netflix; and Apple Pay was similar to many credit cards and payment services. How far could a me-too strategy take Apple? Finally, after 9 years at the helm, Cook had to start thinking about succession. Cook, of course, was very different from Steve Jobs. What type of leader did Cook want to develop for Apple's next act?

## Apple's History

Steve Jobs and Steve Wozniak, a pair of 20-something college dropouts, founded Apple Computer on April Fool's Day, 1976.[2] Working out of the Jobs family garage in Los Altos, California, they built a computer circuit board that they named the Apple I. Within several months, they had made 200 units and had taken on a new partner—A. C. "Mike" Markkula Jr., who as the experienced businessman on the team was instrumental in attracting venture capital. Jobs's mission was to bring an easy-to-use computer to market, which led to the release of the Apple II in April 1978. It sparked a computing revolution that drove the personal computer (PC) industry to $1 billion in annual sales in less than three years.[3] Apple quickly became the industry leader, selling more than 100,000 Apple IIs by the end of 1980. In December 1980, Apple launched a successful initial public offering (IPO).

Apple's competitive position changed fundamentally in 1981 when IBM entered the PC market. The IBM PC, which used Microsoft's disk operating system (DOS) and a microprocessor—also called a central processing unit (CPU)—from Intel, was a relatively "open" system that other producers could clone. Apple, in contrast, practiced horizontal and vertical integration. It relied on its own proprietary designs and refused to license its software to third parties. IBM PCs not only gained more market share but also emerged as the new standard for the industry. Apple responded by introducing the Macintosh in 1984. The Mac marked a breakthrough in ease of use, industrial design, and technical elegance. However, the Mac's slow processor speed and lack of compatible software limited sales. Apple's net income fell by 62% between 1981 and 1984, sending the company into a crisis. Jobs, who was often referred to as the "soul" of the company, was forced out in 1985.[4] The boardroom coup left John Sculley, the executive whom Jobs had recruited from Pepsi-Cola, alone at the helm.

### *The Sculley Years, 1985–1993*

Sculley pushed the Mac into new markets, most notably in desktop publishing and education. Apple's worldwide market share recovered and stabilized at around 8% (see **Exhibit 3a**). By 1990, Apple had $1 billion in cash and was the most profitable PC company in the world. Apple offered its customers a complete desktop solution, including hardware, software, and peripherals that allowed them to simply "plug and play." Apple also stood out for typically designing its products from scratch, using unique components. IBM compatibles narrowed the gap in ease of use in 1990 when Microsoft released Windows 3.0. Still, as one analyst noted, "[T]he majority of IBM and compatible users 'put up' with their machines, but Apple's customers 'love' their Macs."[5]

Macintosh's loyal customers allowed Apple to sell its products at a premium price. Top-of-the-line Macs went for as much as $10,000, and gross profit hovered around 50%. However, as IBM-compatible prices dropped, Macs appeared overpriced. As the volume leader, IBM compatibles were also attracting the vast majority of new applications. Moreover, Apple devoted 9% of sales to research and development (R&D), compared with 5% at Compaq and only 1% at many other IBM-clone manufacturers. After taking on the Chief Technology Officer title in 1990, Sculley tried to move Apple into the mainstream by becoming a low-cost producer of computers with mass-market appeal.

Sculley also chose to forge an alliance with Apple's foremost rival, IBM. They worked on two joint ventures, one to create a new PC operating system (OS) and one aimed at multimedia applications. Apple undertook another cooperative project involving Novell and Intel to rework the Mac OS to run on Intel chips that boasted faster processing speed. These projects, coupled with an ambition to bring out new "hit" products every 6 to 12 months, led to a full-scale assault on the PC industry. But profits dropped, and Sculley was replaced by Michael Spindler, the company's President, in June 1993.

## *The Spindler and Amelio Years, 1993–1997*

Spindler killed the plan to put the Mac OS on Intel chips and announced that Apple would license a handful of companies to make Mac clones. He tried to slash costs and pushed for international growth, but Apple lost momentum: a 1995 *Computerworld* survey found that none of the Windows users would consider buying a Mac, while more than half the Apple users expected to buy an Intel-based PC[6] (see **Exhibit 4** for shipments of PC microprocessors). Spindler, like his predecessor, had high hopes for a revolutionary OS that would turn around the company's fate. But at the end of 1995, Apple and IBM parted ways on their joint ventures. After spending more than $500 million, neither side wanted to switch to a new technology.[7] Following a $69 million loss in Apple's first fiscal quarter of 1996, the company appointed another new CEO, Gilbert Amelio, an Apple board member.[8] Amelio proclaimed that Apple would return to its premium-price differentiation strategy, but Macintosh sales continued to fall. In December 1996, Amelio announced the acquisition of NeXT Software (founded by Jobs after he left Apple) and plans to develop a new OS based on NeXT. Jobs also returned to Apple as a part-time adviser. Despite more restructuring efforts, Apple lost $1.6 billion under Amelio. At one point, insiders believed that Apple was within 90 days of bankruptcy. To save the company, Jobs became the company's interim CEO in September 1997.

## *Steve Jobs and the Apple Turnaround*

Jobs moved quickly to reshape Apple. In August 1997, Apple announced that Microsoft would invest $150 million in Apple and make a five-year commitment to develop core products, such as Microsoft Office, for the Mac. Jobs abruptly halted the Macintosh licensing program. Almost 99% of customers who had bought clones were existing Mac users, cannibalizing Apple's profits.[9] Apple's 15 product lines were slashed to just 4 categories—desktop and portable Macintoshes, for consumers and professionals. Tim Cook, hired by Jobs in 1998 after a career in operations at Compaq and IBM, was credited with streamlining Apple's supply chain. In addition, Apple launched a website to set up direct sales for the first time. Internally, Jobs focused on reinvigorating innovation. Apple pared down its inventory and increased R&D.

Jobs sought to bring a new culture to Apple. While previous CEOs sought to broaden Apple's products, Jobs believed deeply in focus. Apple would soon have one of the narrowest product lines of any company of comparable size. Jobs also believed in extreme practices of secrecy, including a "closed-door policy" in which key cards accessed only certain areas, and creating dummy positions for new hires until they could be trusted. Everyone knew that violation of Apple's culture of confidentiality was grounds for termination.[10] Employees reported that working with Jobs was rewarding but often difficult. Jobs noted, "I don't think I run roughshod over people, but if something sucks, I tell people to their face."[11] Jobs was especially fanatic about industrial design, simplicity, and product elegance.

This approach led to Jobs's first real coup: the iMac, introduced in August 1998. The $1,299 all-in-one computer featured colorful translucent cases with a distinctive eggshell design. Thanks to the iMac, Apple's sales outpaced the industry's average for the first time in years. Following Jobs's return, Apple posted a $309 million profit in its 1998 fiscal year, reversing the previous year's $1 billion loss.

Another priority for Jobs was to break away from Apple's tired, tarnished image. Jobs wanted Apple to be a cultural force. Not coincidentally, perhaps, Jobs retained his position as CEO of Pixar, an animation studio that he had bought in 1986. (Jobs sold Pixar to Walt Disney for $7.4 billion in 2006.) Through multimillion-dollar marketing campaigns such as the successful "Think Different" ads and catchy slogans ("The ultimate all-in-one design," "It just works"), Apple promoted itself as a hip alternative to other computer brands. The goal was to differentiate the Macintosh amid intense competition in the PC industry.

## The Personal Computer Industry

While Apple pioneered the first usable "personal" computing devices, it was IBM that brought PCs into the mainstream in the 1980s. By the early 1990s, a new standard known as "Wintel" (the Windows OS combined with an Intel processor) dominated the industry. Thousands of manufacturers—ranging from Dell Computer to no-name clone makers—built PCs around standard building blocks from Microsoft and Intel. Growth was driven by lower prices and expanding capabilities. The overall industry continued to boom through the early 2000s, propelled by Internet demand and emerging markets such as China. But PC shipments hit a high-water mark in 2011 of 352 million shipments worldwide.[12] In 2018 and 2019, roughly 260 million PCs were shipped, and Gartner predicted the decline would only continue, forecasting 241 million shipments in 2022.[13] Average selling prices (ASPs) were also on the decline: although new PCs were faster and had more memory and storage, ASPs fell by a compound annual rate of 8%–10% per year from the early 1990s through 2005.[14] Over the next decade or so, prices finally stabilized: in 2019, ASPs were $632 dollars, up $17 from 2010.[15]

### *Buyers and Distribution*

PC buyers fell into five categories: home, small and medium-sized business (SMB), corporate, education, and government. Home consumers represented the biggest segment, accounting for nearly half of worldwide PC shipments.[16] While all buyers cared deeply about price, home consumers also valued design, mobility, and wireless connectivity; business consumers balanced price with service and support; and education buyers depended on software availability. SMB customers typically purchased PCs through superstores (Walmart, Costco), electronics retailers (Best Buy), and web-based retailers. At the same time, the so-called "white-box" channel—which featured generic machines assembled by local entrepreneurs—represented a large channel for PC sales, especially in emerging markets. White-box PCs were 40% of the desktop channel in 2017, and 15% of the overall PC market.[17]

### *PC Manufacturers*

The PC industry had grown more concentrated in recent years, with the three top PC vendors—Lenovo, Hewlett-Packard, and Dell—accounting for 65.4% of worldwide shipments in 2019, up from 51% five years earlier (see **Exhibit 3b** for PC manufacturers' market shares). Industry leadership had shifted numerous times in the prior three decades. China-based Lenovo vaulted into the front ranks of PC vendors in 2005 when it acquired IBM's money-losing PC business for $1.75 billion. Lenovo supplanted Hewlett-Packard (HP) as the market leader in early 2014 but ceded the top spot to HP in late 2017, only to take it back again in 2019 with a 24.3% market share.[18] Lenovo's greatest strength was its dominant position in China, the largest PC market in the world since 2012.[19]

Following a rough period after the acquisition of Compaq in 2002, HP outsourced most of its production to Asia and dramatically lowered its costs. But HP's attempt to maintain PC leadership came at a high price: after 2005, HP market share eroded, margins declined, and the board fired three CEOs.[20] HP proposed spinning off PCs in 2011, recanted, then decided again to break up the company

in 2015, splitting its PC and printer business off from its data centers, software, and services business.[21] HP steadily gained share after 2015, retaking the top spot in 2017 with a 22.7% share.[22] In 2019 it fell to second, despite raising its share to 23.6%.[23]

Dell held the third-largest market share, with 17.5% of PC shipments for 2019.[24] Its distinct combination of direct sales and build-to-order manufacturing were popular in the corporate market for a decade. But Dell was late to catch on to a boom in the consumer retail market and struggled with cost controls and poor margins. Faced with a declining share price and investor discontent, founder Michael Dell took the company private with a $25 billion deal completed in late 2013.[25] After going private, Dell retained third place in the PC market, growing its share from 12.0% in 2013. In 2016, Dell acquired EMC, the largest maker of data storage, in a deal valued at $67 billion.[26] With a strong new focus on enterprise software and hardware, as well as cloud storage, Dell went public again at the end of 2018 and had a $38 billion market capitalization in early 2020.

## *Suppliers, Complements, and Substitutes*

Suppliers to the PC industry fell into two categories: those that made products (such as memory chips, disk drives, and keyboards) with many sources, and those that made products (notably microprocessors and operating systems) that had just a few sources. Products in the first category were widely available at highly competitive prices. Products in the second category were supplied chiefly by two firms: Intel and Microsoft (see **Exhibit 4** for Shipments of Intel Architecture Microprocessors, and **Exhibit 5** for selected financial information).

**Microprocessors** Microprocessors, or CPUs, were the hardware "brains" of a PC. Intel had held the majority of the PC CPU market since the 1980s. Historically, its leading-edge technology, manufacturing scale, and a powerful brand, distanced Intel from the competition. Its biggest competitor was Advanced Micro Devices, which sold Intel-compatible CPUs and had a 27% market share in 2019.[27] Performance of CPUs continued to double roughly every 24 to 36 months, but prices had dropped (adjusted for changes in computing power) by an average of 30% per year between 1970 and 2007. However, CPU prices had stabilized in recent years.[28] In 2015, a few firms began shipping PCs with ARM, a low-power, lower-performance, and lower-priced CPU that was used in smartphones. Lack of full compatibility with software applications designed for Intel CPUs kept ARM's market share tiny.[29]

**Operating systems** An OS was the software that managed a PC's resources and supported its applications. Microsoft had dominated this market since the IBM PC in the 1980s, and about 78% of PCs ran a version of Microsoft Windows in 2020.[30] Microsoft's big hit in the new millennium was Windows XP. Introduced in October 2001, 17 million copies of XP were sold in its first eight weeks of sales. Developed at a cost of $1 billion, XP initially garnered for Microsoft between $45 and $60 in revenue per copy.[31] However, the next three generations—Vista (2007), Windows 7 (2009), and Windows 8 (2012)—met with mixed reviews, and each new generation of OS faced higher development, marketing, and support costs. In mid-2015, Microsoft shipped its latest update, Windows 10. Over the next year, it was installed on over 350 million devices. By late 2019, it passed 50% market share, and Windows 7's share fell to 30%.[32]

**Application software, content, and complementary products** The value of a computer corresponded directly to the complementary software, content, and hardware that were available on that platform. Key application software ranged from word processing to Internet browsing. After the early 1990s, the number of PC applications exploded, while ASPs for PC software collapsed. Firms such as Google even offered productivity software (Google Apps) for free. PCs also benefited from a vast

array of complementary hardware, ranging from printers to cameras. However, the number of new, exciting PC applications had slowed, as software developers shifted their focus to phones.

**Alternative technologies** In the early 2000s, consumer electronics (CE) products, ranging from cell phones to game consoles, started to encroach on the functionality that was once the sole purview of the PC. Another alternative emerged with the introduction of Chromebooks by Google in 2011, which ran only cloud-based applications and sold for $200-$350. Demand for Chromebooks grew rapidly in U.S. education, especially K-12 schools. By 2020, Chromebooks captured 60% of the education market, far outdistancing competitors like Apple (15%).[33]

Of course, the most widely used alternatives were smartphones and tablets. With billions of smartphones and hundreds of millions of tablets being sold, PC sales suffered.[34] While several industry insiders worried about the impact of digital devices on the PC industry, Jobs viewed all of these devices as part of an integrated strategy to deliver breakthrough user experiences.

## The Macintosh and Apple's "Digital Hub" Strategy

In 2001, marking Apple's 25th anniversary, Jobs presented his vision for the Macintosh. He believed that the Macintosh had a real advantage for consumers who were becoming entrenched in a digital lifestyle, using digital cameras, portable music players, and digital camcorders, not to mention mobile phones. The Mac could be the preferred "digital hub" to control, integrate, and add value to these devices. Jobs viewed Apple's control of both hardware and software as a unique strength.

Apple subsequently revamped its product line to offer machines that could deliver a cutting-edge, tightly integrated user experience. Thanks to creative marketing and several innovative computer products, such as the ultra-thin Mac Air, Apple began growing market share.[35] The company's greatest strength lay in the premium-priced PC category; 91% of PCs priced above $1,000 in the U.S. market were sold by Apple.[36] Globally, Apple's market share had risen steadily since 2004, placing fourth among global PC manufacturers with a market share of 6.6% in 2019.[37]

**Changing the Macintosh** To accomplish his vision, Jobs made three important changes in the Macintosh. First, and perhaps most important, Apple introduced a new OS in 2001, the first fully overhauled platform released since 1984. Analysts estimated that OS X cost Apple roughly $1 billion to develop. Second, since the early 1990s, Apple had built Macs with an IBM CPU called PowerPC. In 2006, Jobs made a large investment to shift Apple to Intel chips. By the next year, the entire Macintosh line ran on Intel. With "Intel Inside," Apple could produce thinner, lighter laptops as well as more powerful computers. The Mac could also natively run Windows and Windows applications. Since early 2018, rumors widely circulated that Apple was planning another switch from Intel CPUs to AMD or to their own custom ARM chips.

The final piece of the puzzle was a new distribution strategy. The first Apple retail store opened in McLean, Virginia, in 2001. Apple wanted consumers not only to look at the eye-catching Macintosh designs, but also to directly use and experience Apple's software. Most analysts believed that the popularity of media products, such as the iPod, iPhone, and iPad, were critical to bringing consumers into the stores and exposing them to the Mac. By early 2020, the retail division had over 500 stores in 21 countries, and the Apple Store's sales of over $5,500 per square foot far surpassed those of any other retailer.[38] Observers viewed Apple's retail strategy as a huge success: one analyst said that the company had become "the Nordstrom of technology."[39]

## Moving Beyond the Macintosh

**iPod** Jobs's shift toward a digital hub strategy was initiated by the debut of the iPod in 2001, followed by the iPhone in 2007, then the iPad in 2010. While the prospects for the Macintosh business had improved, it was the iPod that set Apple on its explosive growth path. Jobs's focus for the iPod was simplicity: he said that "to make the iPod really easy to use—and this took a lot of arguing on my part—we needed to limit what the device itself would do. Instead, we put functionality in iTunes on the computer. . . . So by owning the iTunes software and the iPod device, that allowed us to make the computer and the device work together, and it allowed us to put the complexity in the right place."[40]

Apple's approach to developing and marketing the iPod became, over the initial and strenuous opposition of Jobs, more open than its strategy for the Macintosh. The iPod could initially sync only with a Mac. Jobs reportedly declared at one point that Windows users would get iPods "over my dead body."[41] Apple's executive team pushed Jobs to change his mind, and he ultimately relented. Opening the iPod provided access to the vast market of Windows users, and sales took off after Apple developed a version of the iPod and the iTunes software that worked on Windows PCs in 2003.

### *The iPhone*

At the January 2007 Macworld, Jobs introduced the iPhone, saying, "Every once in a while a revolutionary product comes along that changes everything. Today, we're introducing three revolutionary products of this class. The first one is a widescreen iPod with touch controls. The second is a revolutionary mobile phone. And the third is a breakthrough Internet communications device. . . . These are not three separate devices, this is one device, and we are calling it iPhone."[42] Hailed as *Time* magazine's "Invention of the Year," the iPhone represented Apple's bid to "reinvent the phone."[43] Two and a half years of development efforts had been devoted to the phone, guarded under intense secrecy, even among the company's own employees. The estimated development cost was around $150 million.

Entry into mobile phones might have been a risky move for Apple. At the time, the industry was dominated by Nokia, Motorola, and Samsung, with a roughly 60% market share. The iPhone, however, changed the rules. A revolutionary 3.5-inch touch-screen interface placed commands at the touch of users' fingertips without a physical keyboard. The iPhone's entire system ran on a specially adapted version of Apple's OS X platform called iOS. Above all, users found it intuitive to use. Apple initially gave the iPhone to only one network operator in most markets. AT&T, the exclusive U.S. operator for the iPhone when it launched, did not provide a subsidy, contrary to the usual practice in the industry. Instead, AT&T agreed to an unprecedented revenue-sharing agreement with Apple, which gave Apple control over distribution and pricing.

The first-generation iPhone sold about 6 million units over five quarters. Over the next six years, Apple released new phones that not only were thinner, faster, and more intelligent, but offered new form factors. More important, Apple revamped its pricing model. Carriers provided a subsidy on the phone in exchange for dropping the revenue-sharing agreement, and some subsidies were $400 per phone or higher. With the release of the iPhone 4 in October 2011, Apple introduced Siri, a voice-activated technology that Apple bought in 2010. With Siri, the user could dictate texts, ask questions, and send emails using voice commands.[44] The introduction of the iPhone 5s in 2013 saw the introduction of Touch ID, which enabled users to unlock their phones using their fingerprint. The iPhone 6 and 6 plus, released in September 2014, had a 4.7-inch and a 5.5-inch screen, respectively, matching the best-selling Android phones. In late 2017, Apple released the iPhone X, which boasted and edge-to-edge display and Face ID, which allowed users to unlock phones simply by looking at the camera. It also came with the highest price tag of any smartphone, starting at $999. The iPhone 11,

released in 2019, featured display and camera upgrades, with prices that started at $699 and went as high as $1499 in the U.S.

Apple's relationship with carriers changed, too. In most markets in the world, Apple moved from a single carrier to multiple carriers selling iPhones. When Apple added new carriers, it had a reputation as a very tough negotiator: Sprint, for example, signed a four-year, $15 billion deal with Apple that committed the carrier to sell at least 24 million iPhones.[45] The combination of big subsidies and expanded distribution caused revenues and unit volumes to explode (see **Exhibit 1b** and **1C**).

Apple was able to capture the majority of the profits in the smartphone industry, taking an estimated 83% of the handset industry's profits in 2016 and 66% in 2019.[46] This was in large part because iPhones were so expensive: the price of the base version iPhone 11, for instance, was more than triple the ASP of Android smartphones ($699 vs. $214).[47] Falling component costs and design improvements also helped to reduce the iPhone's cost. One study showed that the bill of materials for the $1099 iPhone 11 Pro Max was around $490.[48] Apple's drive to keep its costs down was often controversial. Apple had become one of the largest customers of Foxconn in China. After several suicides of Foxconn workers, Apple commissioned a study by the Fair Labor Association (FLA),[49] which discovered "serious and pressing" violations of the FLA's code of conduct. Cook promised quick action to bring subcontractors into compliance. Following another investigation in 2019, Apple found that Foxconn had broken Chinese labor rules and promised again to resolve the issue.[50]

**App Store** One key driver behind the iPhone sensation was the Apple App Store, which Jobs only reluctantly supported. Jobs initially wanted Apple to develop all the apps for the phone, a stance consistent with his preference for closed platforms and total control. Jobs eventually relented, and the App Store launched in July 2008. Apple's App Store was the first outlet that made it easy to distribute, access, and download applications directly onto the mobile phone. Apple reserved the right to approve all applications and kept a 30% cut of the developer's app sales. The popularity of the App Store was stunning. In the first 18 months, 4 billion applications had been downloaded worldwide. By 2019, there were more than two million apps available.[51] Mobile apps had also become a key source of revenue, producing an estimated $50 billion in gross revenues (excluding payments to developers) in 2019.[52]

**Competitors** Competition was fierce in the smartphone industry, where worldwide shipments were nearly 1.4 billion in 2019.[53] The iPhone's greatest competition came from Android, an open and free platform developed by Google (see **Exhibit 6** for a market share comparison by region). As more manufacturers entered the market, innovation on the Android platform exploded. More variety, lower prices, and a comparable set of applications powered Android-based phones to become the most popular smartphones in 2019, accounting for 87% of smartphone shipments in 2019.[54] Apple retained around a 13% market share, while other competitors like Blackberry and Symbian were discontinued.[55]

Among handset manufacturers, Samsung and Huawei were Apple's biggest competitors (see **Exhibit 7** for top 5 smartphone vendors). Samsung was a huge company that made chips, displays, PCs, TVs, and appliances as well as phones. It was a relatively late entrant into the smartphone segment, but it became the volume leader in 2011 with the introduction of its Android-based Galaxy handset. It remained the leader in 2019 with a market share of 22%.[56] Huawei was in second place with an 18% share. Founded in 1987 in Shenzhen, Huawei was originally a telecommunications equipment company, and its share of the handset market had grown steadily since releasing its first smartphone in 2009, despite having virtually no presence in the U.S. In third place behind Huawei was Apple (13% market share), followed by Xiaomi (9.2%) and OPPO (8.3%). Xiaomi and OPPO were both Chinese firms that had first released smartphones in 2011; Xiaomi followed a business model built on selling

inexpensive phones with high-end specifications, while OPPO had grown primarily by selling low-cost phones in China and India, though it had recently begun a rapid push into European markets.[57]

Google's competitor to Apple's App Store, called Play Store, launched in late 2008. In 2014, the number of Android apps surpassed the number available from Apple for the first time, and by 2020 the Play Store had 2.9 million apps available for download.[58] Despite fewer downloads, though, Apple's App Store generated roughly double the revenue of Play Store.[59] While Google had fewer restrictions than Apple,[60] software developers had to write numerous versions of their applications to make them compatible with the wide variety of Android phones.

**Suppliers** The supplier base was structurally different in smartphones than in PCs. The supplier that captured most of the value in smartphones was Qualcomm, which largely controlled CDMA (3G) and LTE (4G)—the two most important protocols for wireless service. Except in China, Qualcomm earned 3.5%–5.0% royalties on the wholesale price of almost every CDMA and LTE phone sold in the world. The CPU business was also structurally different: the vast majority of CPUs in smartphones were based on a design by ARM Holding. ARM licensed its core design for about 1% on each CPU, which sold for roughly $15–$20. Three companies dominated the ARM CPU business in smartphones in the first half of 2019: Qualcomm had 40%, Apple 20%, and Samsung 13%.[61] Dating back to the early days of Apple, Jobs always preferred to control the critical technologies that would drive Apple's differentiation. To grab greater control of mobile devices, Jobs bought two ARM microprocessor companies between 2008 and 2010.[62] Its first in-house processor powered the first-generation iPad and the iPhone 4, both launched in 2010. Until 2013, Apple's chips were manufactured by Samsung, when Apple awarded production rights to Taiwan Semiconductor Manufacturing Company. In 2019, Apple purchased Intel's cellular modem business for $1 billion and aimed to have its own 5G modems in iPhones by 2022.[63] In the meantime, the market leader Qualcomm would be the supplier for the first 5G iPhone, closing a period of bitter litigation between the two companies.[64]

**Pricing and Demand** Smartphone shipments fell 2.3% from 2018 to 2019, continuing a downward trend that had begun in 2017.[65] Talk about a "smartphone plateau" started as early as 2012, when growth in the smartphone market had first begun to slow. Industry analysts noted that developed markets appeared to be saturated, and smartphone tech innovation slowed, making the prospect of an upgrade less exciting to consumers.[66] Apple mirrored the industry: iPhone sales rose steeply up until 2015, then fell in 2016, and fell again in 2019. The data suggested that existing iPhone users were waiting longer to upgrade.[67] Most smartphone producers were counting on 5G to stimulate a new surge in growth, but market analysis firm, Gartner, predicted that 5G smartphones would contribute to only a slight increase in overall smartphone shipments in 2020.[68]

## Moving Beyond the iPhone: The iPad

The iPhone's spectacular success may have satisfied many CEOs, but not Steve Jobs. In 2010, he saw another opportunity to make a bold move to redefine computing with the launch of the iPad. "Some people say, 'Give the customers what they want,'" said Jobs, "but that's not my approach. Our job is to figure out what they're going to want before they do."[69] That was what he did with the iPad. Apple's release of the iPad on March 2, 2010, defined a new device category that Jobs described as "even more intuitive and easier to use than a PC, and where the software and the hardware and the applications need to be intertwined in an even more seamless way than they are on a PC."[70] Before the iPad, tablet sales were trivial. When the iPad launched, market demand was uncertain at best. But doubters were quickly silenced, as sales of the new device took off. More than 450,000 iPads were sold during its first week on the market. Jobs commented, "It feels great to have the iPad launched into the world—it's

going to be a game changer."[71] By the end of 2014, Apple had built another $30 billion business, cumulatively selling nearly 240 million iPads.[72]

Apple's business model for the iPad was slightly different from the iPhone. Apple earned an estimated 25% gross margin on its entry-model iPad by using its own CPU, giving the channel a lower margin and leveraging its scale in purchasing. Apple had lower costs than most competitors, which could only make 15% gross margin at the same retail price.[73] Yet despite Apple's formidable lead, at least 20 major manufacturers launched tablets over the next few years, driving down Apple's once-commanding market share. Apple remained the market leader with a 37% share, followed by Samsung, Huawei, Amazon, and Lenovo.[74]

**Saturation? Lack of innovation?** After tremendous growth in their first three years, tablet sales began to lose momentum in 2014. Tablets got a little thinner, with more memory, but there was little innovation in the category. The fourth quarter of 2014 saw a worldwide year-over-year decline in tablet shipments of 3.2%. This was the first decline since the iPad launched. Apple was hit particularly hard: for FY 2014, unit sales declined by 5% and net revenues were down 4%.[75] iPad sales continued to decline over the next five years, producing only $21 billion in revenue in 2019.[76]

**iCloud** One of Jobs's last acts as CEO was to prepare Apple for the launch of iCloud in October 2011. Jobs's vision was that Apple was "the first to have the insight about your computer becoming a digital hub . . . [which] worked brilliantly. But over the next few years, the hub is going to move from your computer into the cloud. So it's the same digital hub strategy, but the hub's in a different place."[77] iCloud allowed users to synchronize seamlessly across multiple Apple devices by storing data, pictures, music, and so on, in one location on the Internet. Five GB of cloud storage on iCloud was free for Mac, iPhone, iPad, and iPod Touch users. Consumers could also pay for additional storage.[78] To support iCloud, Apple invested in a huge data center in North Carolina at an estimated cost of $500 million.[79] Notably, iCloud worked only with Apple products. Following Apple's lead, OS competitors such as Google and Microsoft offered their own cloud storage services, while product competitors such as Samsung struck deals with Dropbox, a cross-platform cloud storage solution first launched in 2008.

## New Revenue: Wearables, HomePod, and/or Services?

Apple under Steve Jobs had revolutionized four industries: PCs, music, cellphones, and tablets. Shortly before Steve Jobs died in the fall of 2011, he appointed his chief deputy, Tim Cook, to take the helm. While Jobs's passion was industrial design and marketing, Cook had been the mastermind behind Apple's global supply chain and operations. Although Steve Jobs legacy was pervasive at Apple, it became Tim Cook's job to grow the company and take Apple to the next level.

With iPhone sales starting to decline in 2016, it became obvious to Tim Cook and his team that Apple would need to diversify its revenue stream beyond smartphones. If the company wanted to continue to grow, it would need to identify new markets, where Apple could leverage its considerable advantages. In early 2020, Cook attacked three big markets: wearables, voice-based devices, and new services. Indeed, Cook claimed that Apple's Wearables business, which included the Apple Watch and the wireless AirPods earbuds, was the size of a Fortune 200 company in terms of revenue (See **Exhibit 8** for a breakdown of the wearables market).[80] (Apple reported $5.1 billion in revenue from Wearables for the first quarter of 2019, and the cutoff at the time for the Fortune 200 was $14.6 in annual revenue.) In the fourth quarter of its financial 2019, Apple's Services segment generated an all-time high of $12.5 billion in revenue, which would place it comfortably in Fortune's top 100.[81] These two businesses were now the most important frontiers of revenue growth for the company.

### *Apple Watch*

With iPod sales disappearing, and iPad sales under pressure, Cook announced his first new major product initiative in September 2014: the Apple Watch. The Apple Watch supported a variety of applications including iMessage and Twitter, and it included features like a "taptic engine," which communicated notifications to users by tapping out different patterns on their wrist. Reviewers generally reacted positively to the device, but they also noted a steep learning curve and high price ($349 for a base model, or up to $17,000 for an 18-karat "Edition" model).[82] *The New York Times* one-sentence review was: "[It] may not be for you—but someday soon, it will change your world."[83]

Apple sold 12 million Watches in the first year after launch. This was double first-year iPhone sales, but a disappointing number compared to the over 200 million iPhones sold during the same period.[84] The parts and manufacturing costs for the $349 base version of the Apple Watch totaled around $84, giving it a cost/price ratio of 24%, which was significantly lower than other Apple devices.[85] Sales for subsequent versions of the Watch, which boasted new features like faster processors and the ability to make and receive calls, were much stronger: analysts predicted that Apple would capture a 48% share of smartwatches in 2020.[86] Behind Apple were Xiaomi (13.3%), Huawei (10%), Samsung (8.7%), and Fitbit (5.9%), which Google acquired in November 2019 for $2.1 billion.[87] Unit sales for the Apple Watch were estimated to be around 41 million in 2019.[88]

### *AirPods*

Apple introduced the wireless AirPods alongside the iPhone 7, the first iPhone without a standard 3.5 mm headphone jack, in 2016.[89] The response from some was vociferous and highly critical: *The Verge*, for instance, suggested that the announcement was "representative of the trademark Apple arrogance, indicative of a company culture in which doing what's logical and consumer-friendly is often conflated with doing what Apple executives think is best…standards be damned."[90] Regardless, Apple quickly sold out its entire stock of the new $159 earbuds after releasing them in December 2016. Running a custom-designed low-power chip, AirPods won praise for ease of use and long battery life, integration with the iPhone, and innovative features (such as automatically stopping music playback if a user took one of the earbuds out and restarting when he or she replaced it). In 2019, it sold an estimated 60 million pairs, and it expected to sell as many as 85 million pairs in 2020.[91] Apple's AirPods lineup had also expanded to include a $200 pair with a wireless charging Case and the $249 AirPods Pro, which were noise canceling and water resistant. Its share of the "hearables" (i.e., wireless in-ear devices) market was approximately 53%, followed by Samsung (8%).[92]

### *HomePod*

Apple entered the smart speaker market with the HomePod in early 2018. The smart speaker business was booming: global shipments reached 150 million in 2019, a 70% increase from the previous year, with Amazon and Google dominating the market outside of China.[93] To differentiate itself from the competitors like Amazon Echo and Google Home, Apple focused on sound quality, touting the speaker's powerful subwoofer and its "custom array of seven beam-forming tweeters."[94] Reviewers generally agreed that the HomePod had superior sound quality, but most were disappointed with Siri, the virtual assistant on the device, which struggled to perform the same tasks available on other smart speakers.[95] Analysts estimated that Apple captured only 6% of the smart speaker market in the U.S. in 2019.[96] In April 2019, Apple dropped the price of the HomePod from $349 to $299, leaving it about three times as expensive as Amazon's standard Echo speaker and ten times the price of Amazon's Echo Dot.[97] Since parts and manufacturing costs for the HomePod were around $220, Apple had little room to maneuver. Profit margins on the device were unusually low for Apple, even before it cut the price.[98]

### *A $50 Billion Services Segment*

As hardware product sales began to plateau, revenue from services like Apple Music and Apple Care continued to grow rapidly. In the fourth quarter of Apple's financial 2019, they generated an all-time high of $12.5 billion in revenue, with a 64% gross margin.[99] In total, Apple had more than 450 million paid subscriptions, and it hoped to surpass the 500 million mark in 2020.[100]

Apple did not break down its revenue from services in its earnings reports, but the two largest contributors were likely the App Store and licensing fees. In 2019, Apple product users spent $54.2 billion on apps, subscriptions, and in-app purchases. Since Apple typically split revenue 70-30, this implied roughly $16 billion in annual revenue for the company.[101] The bulk of Apple's licensing revenue came from Google, which paid $9 billion in 2018 and an estimated $12 billion in 2019, to remain the default search engine on Safari.[102]

Apple's push into services included Apple Music as well as several new services launched in 2019, including Apple Arcade, Apple TV+, Apple News+ and an Apple Pay-branded credit card. Facing large, entrenched competitors in each category, Apple services highlighted privacy features, carefully-curated content, and sleek user interfaces.

**Apple Music** Apple Music had its roots in Beats Music, a music streaming service that Apple acquired from Beats Electronics in a $3.2 billion deal in 2014. Beats was Apple's largest acquisition ever.[103] Apple's biggest competitor was Spotify, a music streaming service founded in Sweden in 2006. Spotify monetized by running ads and selling monthly subscriptions for ad-free listening. Despite being persistently unprofitable, Spotify was regularly criticized by the music industry for failing to fairly compensate musicians and record companies.[104] The service reached 1 million subscribers by 2011 and launched in the United States the same year; in 2018, it went public with 71 million subscribers and was valued at $27 billion.[105] By 2020, it had more than 100 million subscribers and a total of 248 million monthly active users (MAUs).[106] A Morgan Stanley analyst predicted it would hit 200 million subscribers and 460 million MAUs by 2022.[107]

As of 2020, Apple Music had more than 60 million subscribers.[108] Apple overtook Spotify to become the most popular music streaming service in the United States in April 2019.[109] Subscriptions had grown quickly leading up to 2020, though growth was expected to slow over the next decade.[110] One estimate put Apple's gross Music profit (revenue minus payments to music artists) at around $1 billion, making Music much lower margin than other services.[111] During an interview in 2018, Cook had even commented, "We're not in it for the money…If we're going to continue to have a great creative community, [artists] have to be funded."[112]

**Older Services: AppleCare, iCloud, iTunes** Behind Apple Music was AppleCare (including service parts sales), a collection of extended warranties, protection plans, and other forms of coverage for Apple products, for which customers could pay a single upfront fee or a monthly subscription, which varied depending on the product. AppleCare generated $6.5 billion of revenue in 2019, and analysts predicted that AppleCare revenue would continue to grow between 7% and 12% each year, reaching $10 billion by 2024.[113] Revenues from iCloud, which totaled $2.5 billion in revenue in 2019, 24% more than the previous year, were also expected to grow at a falling annual rate. Revenues from sales of books, movies, and other media were shrinking year by year, totaling $4.7 billion in 2019, a 4% decline from the 2018.[114]

**Apple Pay** Cook introduced Apple Pay, Apple's new mobile payment system, in late 2014.[115] Most of the nation's largest banks and credit card companies had already signed on to support it, and retailers quickly pledged to accept the new payment system in their stores. To set it up, users added

the information for a credit or debit card to Apple Pay on their iPhone, which allowed them to make payments by holding their iPhone or Apple Watch near a wireless payment terminal. Not surprisingly, Apple faced stiff competition from banks, credit card companies, PayPal, and Samsung and Google, which launched their own mobile payment systems. Like with other products and services, Apple touted privacy features like TouchID authentication. In 2019, Apple Pay's 30 million users made up 47% of U.S. mobile payment users, ahead of Google (19%) and Samsung (17%).[116]

In 2018, Apple entered a partnership with Goldman Sachs to launch an Apple Pay-branded credit card.[117] Users could make payments through Apple Pay and receive 2% cash back or, if mobile payments were not an option, use a physical card.[118] Instead of plastic, the Apple Card was made of titanium and, as an added security feature, did not have a credit card number printed on it. According to one estimate, Apple Pay revenues had grown from $11 million in 2015 to $988 million in 2019.[119]

**Apple TV+** Apple announced in August 2017 that it would invest $1 billion in procuring and producing original content over the next year. Apple officially launched Apple TV+ in November 2019, a new service that cost $4.99 per month and came free for one year with some Apple devices. Original content boasted a lineup from Steven Spielberg, J.J. Abrams, and Oprah Winfrey. In total, Apple had committed more than $6 billion to new shows and movies, matching Amazon's spending on Prime content in 2019, but still far below Netflix's $15 billion in content spending in 2019.[120] Netflix also enabled its service on virtually every platform: users could consume Netflix on all PCs, smartphones, tablets, smart TVs, Roku, etc.

Despite enormous budgets, Apple TV+'s first slate of shows received poor reviews by critics.[121] The response from viewers was more positive: millions of users were using the service in its first week after launch, and most who watched one episode of a TV+ show went on to watch the next. [122] According to one estimate, the service had signed up more than 33 million subscribers, putting TV+ ahead of Hulu (32 million) and Disney+ (29 million), but the vast majority had likely received their first year free with the purchase of an Apple product.[123]

**Apple Arcade** Apple launched Apple Arcade, its video game subscription service, in September 2019. Charging $4.99 per month for access to 100 games exclusive to Apple, users could play games on multiple Apple devices including the iPhone, the iPad, and Apple TV.[124] At the time, players in the video game subscription space were numerous and diverse: prices ranged from $5 to $15 per month, catalogs ranged from 100 to more than 800 titles, and some services provided limited access to games before their official release.[125] Microsoft did not release a subscriber count for its Game Pass service, but according to one estimate, it was the most popular video game subscription service with 9.5 million monthly users at the end of 2019; EA access, meanwhile, had 5 million subscribers, and PlayStation now had 1 million.[126] According to one estimate, Apple Arcade would reach 12 million subscribers by the end of 2020.[127]

**Apple News+** Apple's first dedicated news application was Newsstand, which displayed newspapers and magazines that could be purchased individually or through an in-app subscription. Apple replaced Newsstand with News, a free news aggregator that presented articles in a personalized feed, in 2015. News was similar to many news-reading apps already on the market, particularly Flipboard, which would continue to be Apple's biggest competition. In 2019, Apple introduced News+, a premium version of News that featured more content, including from The *Wall Street Journal*, and cost $9.99 per month. According to Apple, the News app was used by 100 million people each month in Australia, Canada, the U.K., and the U.S. in January 2020, but it did not disclose how many had News+ subscriptions.[128] For comparison, Flipboard had more than 145 million monthly active users.[129]

**Self-driving cars** Apple began hiring battery experts and other automotive engineers into a skunkworks project code-named "Project Titan" near Apple's headquarters in Cupertino in 2014. Cook confirmed in a June 2017 interview, "We're focusing on autonomous systems. It's a core technology that we view as very important." Cook also called the effort to develop self-driving technology "the mother of all AI projects."[130] Apple applied for a permit to test self-driving cars in California, and by the fall of 2017, test vehicles—a Lexus SUV outfitted with autonomous driving technology—began to appear on the roads near Apple's campus.[131] In 2019, Apple acquired the self-driving startup Drive.ai, once valued at $200 million, for an undisclosed amount.[132]

**Privacy-as-service** At Apple events and in promotional materials, Apple emphasized its commitment to keeping its users' data private and secure. Tim Cook believed that Apple was truly different from companies whose business models were built around gathering user data to generate targeted advertisements—e.g., Google and Facebook. This commitment to privacy manifested in different ways in each of Apple's services—for example, the various security features included in Apple Pay. But Cook wanted to take privacy one step further: with the launch of new features like Apple ID single sign-in, a privacy-minded version of sign-in options offered by Google and Facebook, Apple began to frame privacy itself as a service—a service that it was uniquely capable of providing. On occasion, though, it was forced to abandon certain privacy features under pressure from the U.S. government. In early 2020, for instance, Apple abandoned plans to let iPhone users fully encrypt backup files on iCloud after receiving complaints from the FBI that it would harm investigations.[133]

## Apple Inc. in the Next Decade?

Most CEOs on the planet would have loved to be in Tim Cook's position: Apple was fabulously profitable, with the best brand on the planet. The company had one of the strongest balance sheets, with the cash to do almost anything it wanted. Customers loved its hardware, and they were often willing to pay substantial premiums over their competitors' products. Yet Apple in 2025 or 2030 would have to look very different from the Apple of 2020. Cook needed to answer: Would Apple be a hardware-first or a services-first? Competitors such as Netflix or Spotify were hardware agnostic: They enabled their services on virtually everyone's products. But in theory, services could alternatively be used to differentiate Apple's iPhone and other hardware. How might a services-first mentality change Apple's strategy? Apple had also long relied on its ability to differentiate its products. If services were key, how would Apple differentiate those services? And finally, what type of skills did Tim Cook want in the next CEO? Cook would be 60 years old in 2020. He had not announced any plans to retire, but there were obvious questions for management succession. What kind of leadership did Cook and the Apple board need to take the company to the next level?

**Exhibit 1a** Apple Inc., Selected Financial Information, FY2001–FY2019 (in millions of dollars, except for number of employees and stock-related data)

| | 2001 | 2003 | 2005 | 2007 | 2009 | 2011 | 2013 | 2015 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Net sales** | 5,363 | 6,207 | 13,931 | 24,578 | 42,905 | 108,249 | 170,910 | 233,715 | 229,234 | 265,595 | 260,174 |
| **Cost of sales** | 4,128 | 4,499 | 9,889 | 16,426 | 25,683 | 64,431 | 106,606 | 140,089 | 141,048 | 163,756 | 161,782 |
| **Research and development** | 430 | 471 | 535 | 782 | 1,333 | 2,429 | 4,475 | 8,067 | 11,581 | 14,236 | 16,217 |
| **Selling, general, and administrative** | 1,138 | 1,212 | 1,864 | 2,963 | 4,149 | 7,599 | 10,830 | 14,329 | 15,261 | 16,705 | 18,245 |
| **Operating income (loss)** | -333 | 25 | 1,643 | 4,407 | 11,740 | 33,790 | 48,999 | 71,230 | 61,344 | 70,898 | 63,930 |
| **Net income (loss)** | -25 | 69 | 1,328 | 3,495 | 8,235 | 25,922 | 37,037 | 53,394 | 48,351 | 59,531 | 55,256 |
| **Total cash, cash equivalents, and marketable securities** | 4,336 | 4,566 | 8,261 | 15,386 | 23,464 | 25,952 | 40,590 | 41,995 | 74,181 | 66,301 | 100,557 |
| **Accounts receivable, net** | 466 | 766 | 895 | 1,637 | 3,361 | 5,369 | 13,102 | 16,849 | 17,874 | 23,186 | 22,926 |
| **Inventories** | 11 | 56 | 165 | 346 | 455 | 776 | 1,764 | 2,349 | 4,855 | 3,956 | 4,106 |
| **Net property, plant, and equipment** | 564 | 669 | 817 | 1,832 | 2,954 | 7,777 | 16,597 | 22,471 | 33,783 | 41,304 | 37,378 |
| **Total assets** | 6,021 | 6,815 | 11,516 | 25,347 | 47,501 | 116,371 | 207,000 | 290,345 | 375,319 | 365,725 | 338,516 |
| **Total liabilities** | 2,101 | 2,592 | 4,088 | 10,815 | 15,861 | 39,756 | 83,451 | 170,990 | 241,272 | 258,578 | 248,028 |
| **Total shareholders' equity** | 3,920 | 4,223 | 7,428 | 14,532 | 31,640 | 76,615 | 123,549 | 119,355 | 134,047 | 107,147 | 90,488 |
| **Cash dividends paid** | - | - | - | - | - | - | -10,564 | -11,561 | -12,769 | -59,531 | -14,119 |
| **Number of employees** | 11,434 | 13,566 | 16,820 | 23,700 | 36,800 | 63,100 | 84,400 | 110,000 | 123,000 | 132,000 | 137,000 |
| **International sales/sales** | 45% | 42% | 40% | 40% | 46% | 61% | 61% | 65% | 63% | 63% | 60% |
| **Gross margin** | 23% | 27% | 29% | 33% | 40% | 40% | 37% | 40% | 39% | 38% | 38% |
| **R&D/sales** | 8% | 8% | 4% | 3% | 3% | 2% | 3% | 3% | 5% | 5% | 6% |
| **SG&A/sales** | 21% | 20% | 13% | 12% | 10% | 7% | 6% | 6% | 7% | 6% | 7% |
| **Return on sales** | -6% | 0% | 12% | 18% | 27% | 31% | 29% | 30% | 27% | 27% | 25% |
| **Return on assets** | 0% | 1% | 12% | 14% | 17% | 22% | 18% | 18% | 13% | 12% | 16% |
| **Return on equity** | -0.64% | 1.63% | 17.88% | 24.05% | 26.03% | 33.83% | 29.98% | 44.74% | 36.07% | 55.56% | 61.06% |
| **Stock price low**[a] | 1.04 | 0.94 | 2.71 | 9.81 | 11.71 | 40.41 | 57.09 | 97.72 | 107.68 | 150.24 | 145.72 |
| **Stock price high** | 1.94 | 1.67 | 7.69 | 22.14 | 26.99 | 60.41 | 96.68 | 134.54 | 195.96 | 233.47 | 233.47 |
| **P/E ratio at period-end** | NM | 30.94 | 24.28 | 28.3 | 18.86 | 10.14 | 7.29 | 8.33 | 11.79 | 14.44 | 13.4 |
| **Market value at period-end** | 3,367 | 2,982 | 52,081 | 128,465 | 154,303 | 346,369 | 448,639 | 687,450 | 927,168 | 956,625 | 1,112,797 |

Source: Compiled from Capital IQ data and Thomson One, as well as company documents.

[a] Share price data reflect calendar-year results and also reflect the retroactive application of two stock splits: a 2:1 split on February 28, 2005 and a 7:1 split on June 9, 2014.

**Exhibit 1b** Apple's Net Sales by Product Category, 2012–2019 (in millions of dollars)

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| iPhone | 78,692 | 91,219 | 101,991 | 155,041 | 136,700 | 139,337 | 164,888 | 142,381 |
| iPad | 30,945 | 31,980 | 30,283 | 23,227 | 20,628 | 18,802 | 18,380 | 21,280 |
| Mac | 23,221 | 21,483 | 24,079 | 25,471 | 22,831 | 25,569 | 25,198 | 25,740 |
| iPod | 5,615 | 4,411 | - | - | - | - | - | - |
| Services | 12,890 | 16,051 | 18,063 | 19,909 | 24,348 | 32,700 | 39,748 | 46,291 |
| Wearables, Home, and Accessories | 5,145 | 5,706 | 8,379 | 10,067 | 11,132 | 12,826 | 17,381 | 24,482 |
| **Total net sales** | **156,508** | **170,910** | **182,795** | **233,715** | **215,639** | **229,234** | **265,595** | **260,174** |

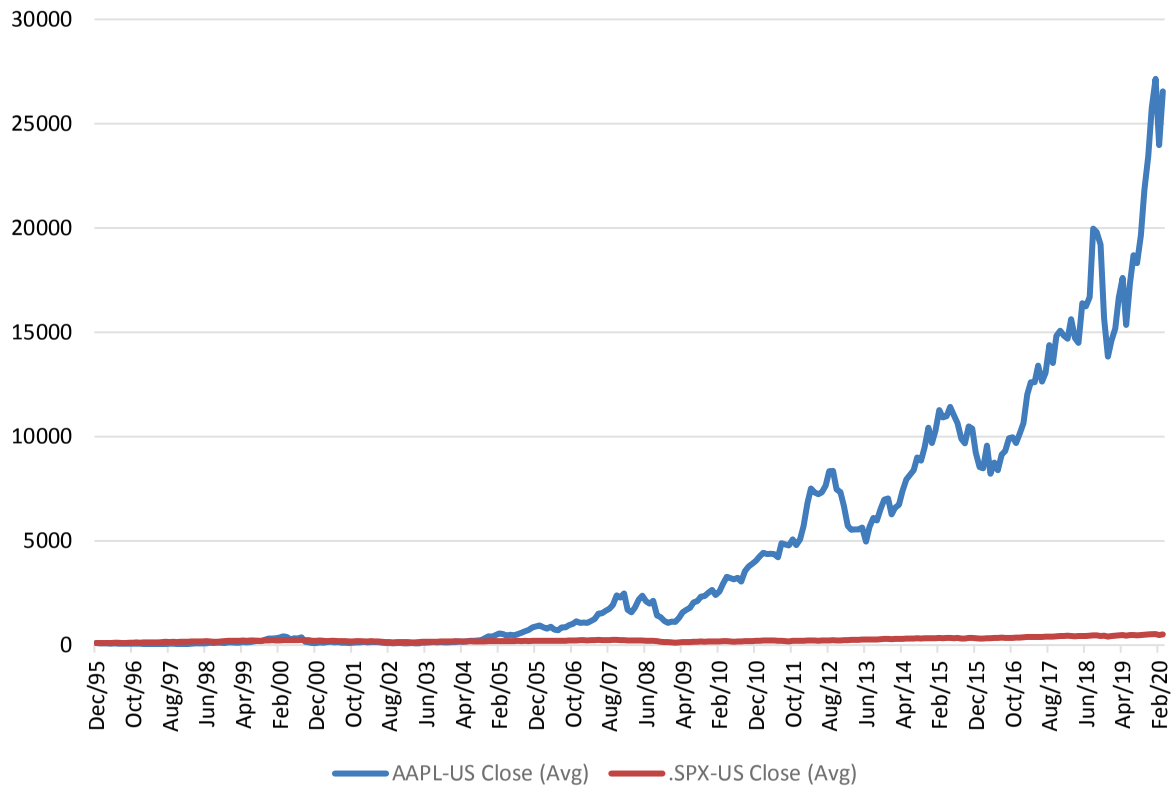
Source: Compiled from Apple's financial statements and casewriter calculations.

**Exhibit 1c** Apple Product Unit Sales, 2010-2019

| | 2010 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| Macs | **13,662** | **18,158** | **18,906** | **20,587** | **18,484** | **19,251** | **18,210** | **19,100** |
| *Net sales per unit sold* | *$1,279* | *$1,279* | *$1,274* | *$1,237* | *$1,235* | *$1,342* | *$1,385* | *$1,250* |
| iPads | 7,458 | 58,310 | 67,977 | 54,856 | 45,590 | 43,753 | 43,540 | 49,170 |
| *Net sales per unit sold* | *$665* | *$531* | *$445* | *$423* | *$452* | *$439* | *$422* | *$435* |
| iPods | 50,312 | 35,165 | 14,377 | - | - | - | - | - |
| *Net sales per unit sold* | *$164* | *$160* | *$159* | - | - | - | - | - |
| iPhone units sold | 39,989 | 125,046 | 169,219 | 231,218 | 211,884 | 216,756 | 217,720 | 180,020 |
| *Net sales per unit sold* | *$630* | *$629* | *$603* | *$671* | *$645* | *$652* | *$757* | *$761* |

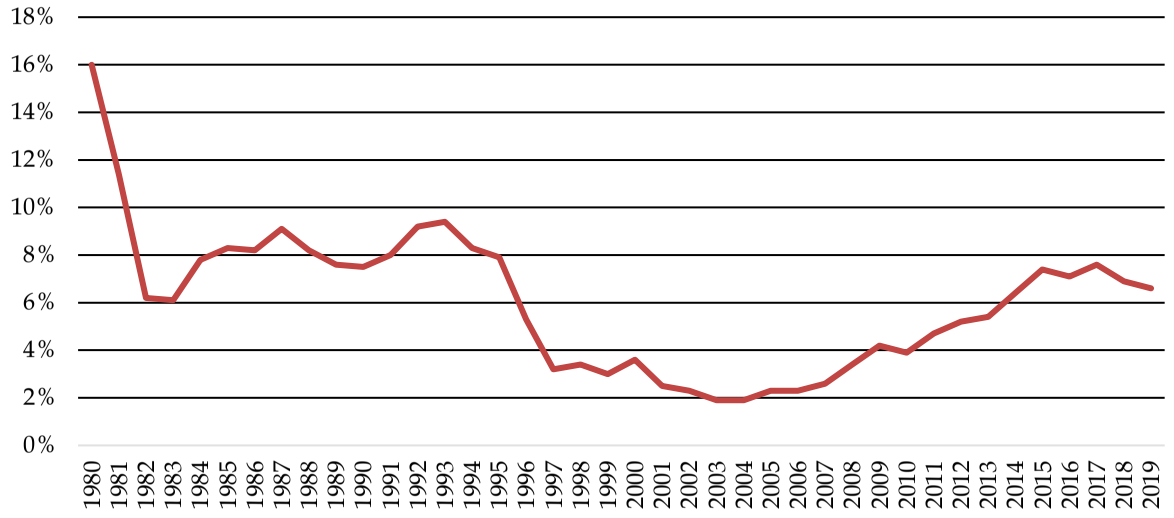
Source: Data from Apple's financial statements and analyst reports published by Canaccord Genuity.

**Exhibit 2** Apple's Share Price vs. S&P 500 Index, 1995-2020 (December 31, 1995 = 100)




Source: Created by casewriter using data from ThomsonOne, accessed March 2020.

**Exhibit 3a** Apple's Worldwide PC Market Share, 1980-2019




Source: Adapted from InfoCorp., International Data Corp., Gartner Dataquest, and Merrill Lynch data.

**Exhibit 3b** PC Manufacturers: Worldwide Market Shares, 2008–2019

| | 2008 | 2010 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|
| Hewlett-Packard | 18.9% | 18.5% | 16.6% | 18.4% | 19.4% | 20.9% | 22.7% | 23.1% | 23.6% |
| Dell | 14.7% | 12.5% | 11.1% | 13.5% | 14.2% | 15.7% | 16.1% | 17.0% | 17.5% |
| Lenovo[a] | 7.6% | 9.8% | 15.0% | 19.2% | 20.8% | 21.3% | 21.1% | 23.1% | 24.3% |
| Acer | 10.9% | 12.4% | 9.6% | 7.8% | - | 6.8% | 6.8% | 6.9% | 6.4% |
| Toshiba | 4.8% | 5.5% | - | - | - | - | - | - | - |
| ASUS | - | - | 6.8% | - | 7.0% | 7.4% | 6.6% | - | - |
| Apple | 3.4% | 3.9% | 5.0% | 6.4% | 7.4% | 7.1% | 7.6% | 6.9% | 6.6% |
| **Total shipments (in millions)** | **287.6** | **346.8** | **352.4** | **308.6** | **275.8** | **260.2** | **259.5** | **259.6** | **266.7** |

Sources: "PC Market Records Modest Gains During Fourth Quarter of 2010, According to IDC," IDC press release, January 12, 2011; "PC Market Stumbles on HDD Shortage While U.S. Market Sees Worst Annual Growth Since 2001, According to IDC," IDC press release, January 11, 2012; "PC Leaders Continue Growth And Share Gains as Market Remains Slow," IDC press release, January 12, 2015; "PC Market Stabilizes with Solid Fourth Quarter Shipments Despite Component Shortages," IDC press release, January 11, 2017; "PC Market Achieves First Positive Holiday Quarter Shipment Growth in Six Years," IDC press release, January 11, 2018; Apple Inc. annual financial reports; and casewriter estimates; "Traditional PC Volumes Close Out an Impressive 2019," IDC, January 13, 2020. (For 2010, http://www.securityweek.com/idc-reveals-data-global-pc-shipments-q4-2010; for 2012, http://www.zdnet.com/article/idc-hp-is-still-top-pc-vendor-worldwide-amid-soft-q4-sales/.)

Note: The sampling of market shares comes mainly from annual listings of the top five PC makers, as measured by IDC. Absence of a figure indicates that a company placed below the top five in a given year.

[a] Lenovo acquired IBM's PC business in mid-2005.

**Exhibit 4** Shipments and Installed Base of Intel Architecture Microprocessors (in millions of units)

| Total Shipments | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Intel Architecture CPUs Shipped | 126 | 170 | 230 | 287 | 315 | 344 | 322 | 290 | 284 | 278 | 275 |
| Installed Base of Wintel PCs | 1,111 | 1,281 | 1,505 | 1,782 | 2,067 | 2,364 | 2,619 | 2,824 | 3,004 | 3,160 | 3,294 |
| Mac units shipped | - | - | 5.7 | 9.9 | 14.4 | 17.1 | 19.6 | 18.4 | 19.3 | 18.2 | 19.1 |
| Intel-Mac installed base | - | - | 5.7 | 15.6 | 30 | 47.1 | 66.7 | 85.1 | 104.4 | 122.2 | 141.1 |

Source: Adapted from Gartner Dataquest, InfoCorp., IDC, Merrill Lynch, Credit Suisse data, and company data.

Notes: Between 5% and 10% of total microprocessor shipments went into non-PC end products. In any given year, as much as 60% of microprocessors in the total installed base involved older technologies that were probably no longer in use. The figures for PowerPC shipments included microprocessors destined for Sony PlayStation and Xbox 360 machines. Figures for "Mac units shipped" over Macintosh calendar-year sales.

**Exhibit 5** Apple's Competitors: Selected Financial Information, 2010-2019 (in $ millions)

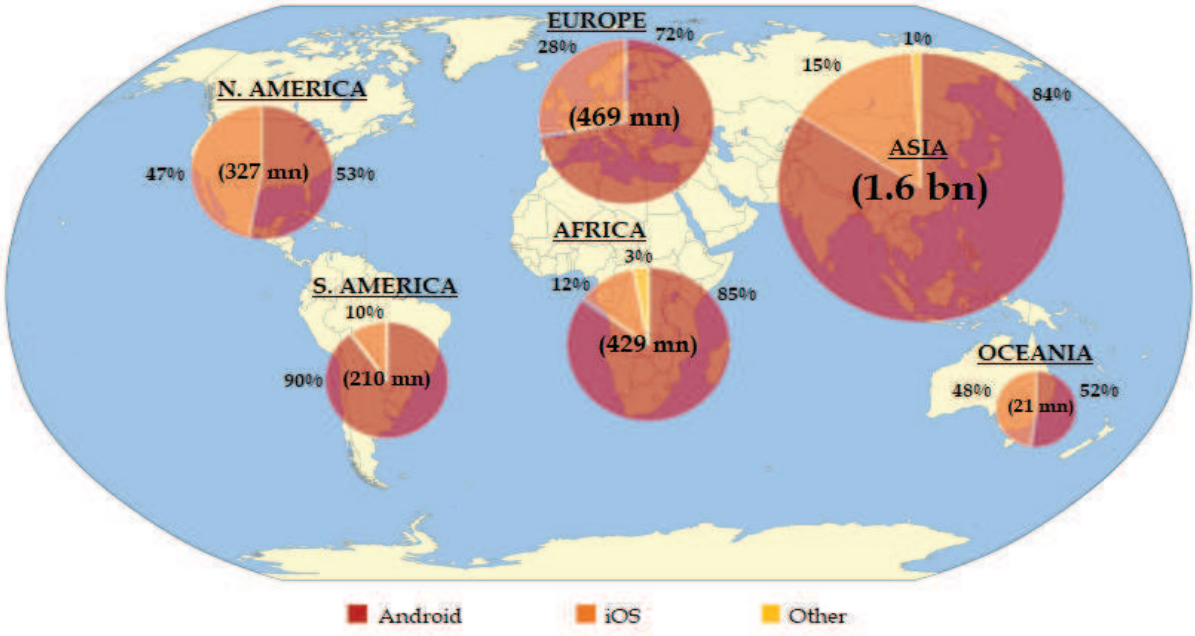
| | 2010 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| **Microsoft** | | | | | | | | |
| Total revenues | 62,484 | 73,723 | 86,833 | 93,580 | 85,320 | 96,571 | 110,360 | 125,843 |
| Cost of sales | 12,395 | 17,530 | 26,934 | 33,038 | 32,780 | 34,261 | 38,353 | 42,910 |
| R&D | 8,714 | 9,811 | 11,381 | 12,046 | 11,998 | 13,037 | 14,726 | 16,876 |
| SG&A | 16,685 | 18,426 | 20,632 | 20,324 | 19,260 | 19,942 | 22,223 | 23,098 |
| Net income | 18,760 | 16,978 | 22,074 | 12,193 | 16,798 | 25,489 | 16,571 | 39,240 |
| Total assets | 86,113 | 121,271 | 172,384 | 174,472 | 193,468 | 250,312 | 258,848 | 286,556 |
| Total liabilities | 39,938 | 54,908 | 82,600 | 94,389 | 121,471 | 162,601 | 176,130 | 184,226 |
| Total shareholders' equity | 46,175 | 66,363 | 89,784 | 80,083 | 71,997 | 87,711 | 82,718 | 102,330 |
| Gross margin | 80.2% | 76.2% | 69.0% | 64.7% | 61.6% | 64.5% | 65.2% | 65.9% |
| R&D/sales | 13.9% | 13.3% | 13.1% | 12.9% | 14.1% | 13.5% | 13.3% | 13.4% |
| SG&A/sales | 26.7% | 25.0% | 23.8% | 21.7% | 22.6% | 20.7% | 20.1% | 18.4% |
| Return on sales | 30.0% | 23.0% | 25.4% | 13.0% | 19.7% | 30.4% | 31.8% | 31.4% |
| Market capitalization | 223,608 | 256,375 | 343,566 | 373,506 | 438,017 | 556,564 | 828,474 | 1,054,145 |

| | 2010 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| **Intel** | | | | | | | | |
| Total revenues | 43,623 | 53,341 | 55,870 | 55,355 | 59,387 | 62,761 | 70,848 | 71,965 |
| Cost of sales | 15,132 | 20,190 | 20,261 | 20,676 | 23,196 | 23,663 | 27,111 | 29,825 |
| R&D | 6,576 | 10,148 | 11,537 | 12,128 | 12,740 | 13,035 | 13,543 | 13,362 |
| SG&A | 6,309 | 8,057 | 8,136 | 7,930 | 8,397 | 13,035 | 13,543 | 13,362 |
| Net income | 11,464 | 11,005 | 11,704 | 11,420 | 10,316 | 9,601 | 21,053 | 21,048 |
| Total assets | 63,186 | 84,351 | 91,900 | 101,459 | 113,327 | 123,249 | 127,963 | 136,524 |
| Total liabilities | 13,756 | 33,148 | 36,035 | 40,374 | 47,101 | 54,230 | 53,400 | 59,020 |
| Total shareholders' equity | 49,430 | 51,203 | 55,865 | 61,085 | 66,226 | 69,019 | 74,563 | 77,504 |
| Gross margin | 65.3% | 62.1% | 63.7% | 62.6% | 61.6% | 62.3% | 61.7% | 58.6% |
| R&D/sales | 15.1% | 19.0% | 20.6% | 21.9% | 21.5% | 20.8% | 19.1% | 18.6% |
| SG&A/sales | 14.5% | 15.1% | 14.6% | 14.3% | 14.1% | 20.8% | 19.1% | 18.6% |
| Return on sales | 26.3% | 20.6% | 20.9% | 20.6% | 17.4% | 29.3% | 32.8% | 31.2% |
| Market capitalization | 118,756 | 101,945 | 172,305 | 135,295 | 172,477 | 212,674 | 219,139 | 297,845 |
| | | | | | | | | |
| **Huawei** (private) | | | | | | | | |
| Total revenues | 27,687 | 35,326 | 46,468 | 60,841 | 75,118 | 85,864 | 108,943 | 121,276 |
| Cost of sales | 15,500 | 21,259 | 25,918 | 35,474 | 44,855 | 51,988 | 6,692 | 74,799 |
| R&D | 2,677 | 4,772 | 6,586 | 9,181 | 11,002 | 12,758 | 15,334 | 17,409 |
| SG&A | 4,768 | 6,269 | 7,728 | 9,654 | 12,491 | 13,284 | 16,060 | 16,956 |
| Net income | 3,748 | 2,504 | 4,491 | 5,685 | 5,338 | 6,750 | 8,947 | 9,964 |
| Total assets | 27,146 | 33,691 | 49,947 | 57,321 | 63,893 | 71,867 | 100,573 | 111,594 |
| Total liabilities | 16,621 | 21,655 | 33,826 | 38,981 | 43,711 | 46,886 | 65,367 | 73,091 |
| Total shareholders' equity | 10,526 | 12,036 | 16,121 | 18,340 | 20,182 | 24,977 | 35,145 | 38,453 |
| Gross margin | 44.0% | 39.8% | 44.2% | 41.7% | 40.3% | 39.5% | 38.6% | 38.3% |
| R&D/sales | 9.7% | 13.5% | 14.2% | 15.1% | 14.6% | 14.9% | 14.1% | 14.4% |
| SG&A/sales | 17.2% | 17.7% | 16.6% | 15.9% | 16.6% | 15.5% | 14.7% | 14.0% |
| Return on sales | 13.5% | 7.1% | 9.7% | 9.3% | 7.1% | 9.2% | 9.9% | 10.7% |
| Market capitalization | - | - | - | - | - | - | - | - |

| | 2010 | 2012 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|
| **Spotify** | | | | | | | | |
| Total revenues | - | - | - | - | 3,140 | 4,431 | 6,202 | 7,574 |
| Cost of sales | - | - | - | - | 2,714 | 3,511 | 4,606 | 5,646 |
| R&D | - | - | - | - | 145 | 224 | 467 | 552 |
| SG&A | - | - | - | - | 578 | 900 | 1,065 | 1,300 |
| Net income | - | - | - | - | (573) | (1,436) | (92) | (208) |
| Total assets | - | - | - | - | 2,234 | 3,366 | 5,113 | 5,736 |
| Total liabilities | - | - | - | - | 2,489 | 3,108 | 2,644 | 3,455 |
| Total shareholders' equity | - | - | - | - | (255) | 258 | 2,469 | 2,281 |
| Gross margin | - | - | - | - | 13.6% | 20.8% | 25.7% | 25.5% |
| R&D/sales | - | - | - | - | 4.6% | 5.1% | 7.5% | 7.3% |
| SG&A/sales | - | - | - | - | 18.4% | 20.3% | 17.2% | 17.2% |
| Return on sales | - | - | - | - | 11.8% | -9.2% | -0.8% | -0.8% |
| Market capitalization | - | - | - | - | - | - | 29,956 | 30,359 |
| **Netflix** | | | | | | | | |
| Total revenues | 2,163 | 3,609 | 5,505 | 6,780 | 8,830 | 11,692 | 15,794 | 20,156 |
| Cost of sales | 1,357 | 2,652 | 3,753 | 4,952 | 6,258 | 8,033 | 9,968 | 12,440 |
| R&D | 163 | 329 | 472 | 651 | 780 | 954 | 1,222 | 1,545 |
| SG&A | 358 | 578 | 877 | 1,231 | 1,413 | 1,867 | 3,000 | 3,567 |
| Net income | 161 | 17 | 267 | 123 | 187 | 559 | 1,211 | 1,867 |
| Total assets | 982 | 3,968 | 7,043 | 10,203 | 13,587 | 19,013 | 25,974 | 33,976 |
| Total liabilities | 692 | 3,223 | 5,185 | 7,979 | 10,907 | 15,431 | 20,736 | 26,394 |
| Total shareholders' equity | 290 | 745 | 1,858 | 2,223 | 2,680 | 3,582 | 5,239 | 7,582 |
| Gross margin | 37.2% | 26.5% | 31.8% | 32.3% | 29.1% | 31.3% | 36.9% | 38.3% |
| R&D/sales | 7.5% | 9.1% | 8.6% | 9.6% | 8.8% | 8.2% | 7.7% | 7.7% |
| SG&A/sales | 16.6% | 16.0% | 15.9% | 18.2% | 16.0% | 16.0% | 19.0% | 17.7% |
| Return on sales | 13.1% | 1.4% | 7.3% | 4.5% | 4.3% | 7.2% | 10.2% | 12.9% |
| Market Capitalization | 12,344 | 9,228 | 26,849 | 40,415 | 61,312 | 123,497 | 143,597 | 150,581 |

Source: Created by casewriter using data from Capital IQ, Thomson One, and company documents.

**Exhibit 6** iOS v. Android Market Share by Geography (as of February 2020)




Source: Made by casewriter based on data from Statcounter. Image is from: https://commons.wikimedia.org/wiki/File:Blank_map_of_the_world_(Robinson_projection)_(10E).svg.

**Exhibit 7** Top 5 Worldwide Smartphone Market Shares -by Vendor, 2013–2019

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|
| Samsung | 31.0% | 24.5% | 22.3% | 21.1% | 21.6% | 20.8% | 21.6% |
| Apple | 15.1% | 14.8% | 16.1% | 14.6% | 14.7% | 14.9% | 13.9% |
| Huawei | 4.8% | 5.7% | 7.4% | 9.5% | 10.4% | 14.7% | 17.6% |
| OPPO | - | - | 3.0% | 6.8% | 7.6% | 8.1% | 8.3% |
| Xiaomi | - | - | - | 3.6% | 6.3% | 8.5% | 9.2% |
| **Total shipments (millions)** | **1,019.4** | **1,301.1** | **1,437.2** | **1,473.4** | **1,472.4** | **1402.6** | **1371.0** |

Source: Created by casewriter using data from "In a Near Tie Apple Closes the Gap on Samsung in the Fourth Quarter as Worldwide Smartphone Shipments Top 1.3 Billion for 2014," IDC press release, January 29, 2015; "Worldwide Smartphone Shipments Top One Billion Units for the First Time," IDC press release, January 27, 2014; "Apple's iPhone grew to 25.1% global market share in 2012," *Apple Insider*, January 25, 2013, http://appleinsider.com/articles/13/01/25/apples-iphone-grew-to-251-global-market-share-in-2012, accessed March 24, 2015; Nathan Olivarez-Giles, "Smartphone Shipments Rose 61% Worldwide in 2011," *Los Angeles Times*, February 6, 2012; and Lance Whitney, "Apple, Android Surge in 2010; Nokia, RIM Slip," CNET, February 7, 2011, http://www.cnet.com/news/apple-android-surge-in-2010-nokia-rim-slip/; IDC press release, "Apple Takes Top Spot," January 30, 2020, https://www.idc.com/getdoc.jsp?containerId=prUS45964220.

**Exhibit 8** Worldwide Wearable Unit Shipments and Market Share, 2016–2019 (millions of units)

| | 2016 | | 2017 | | 2018 | | 2019 | |
|---|---|---|---|---|---|---|---|---|
| | Units | Market Share | Units | Market Share | Units | Market Share | Units | Market Share |
| Fitbit | 22.5 | 22.0% | 15.4 | 13.3% | 13.8 | 7.8% | 15.9 | 4.7% |
| Xiaomi | 15.7 | 15.4% | 15.7 | 13.6% | 23.3 | 13.1% | 41.7 | 12.4% |
| Apple | 10.7 | 10.5% | 17.7 | 15.3% | 48 | 27.0% | 106.5 | 31.7% |
| Garmin | 6.1 | 5.9% | 6.3 | 5.4% | - | - | - | - |
| Fossil | - | - | 4.9 | 4.3% | - | - | - | - |
| Samsung | - | - | - | - | 12.2 | 6.9% | 30.9 | 9.2% |
| Huawei | - | - | - | - | 11.2 | 6.3% | 27.9 | 8.3% |
| Others | 43 | 42.0% | 55.5 | 48.1% | 69.4 | 39.0% | 113.5 | 33.7% |
| **Total** | **102.4** | **100.0%** | **115.4** | **100.0%** | **178.0** | **100.0%** | **336.5** | **100.0%** |

Sources: IDC press release, "The Worldwide Wearables Market Leaps 126.9% in the Fourth Quarter and 171.6% in 2015, According to IDC," *Business Wire*, February 23, 2016. Jeremy Horwitz, "IDC: Wearables grew 7.7% in Q4 2017, Apple passes Xiaomi and Fitbit for first place," *VentureBeat,* March 1, 2018; IDC press release, "Shipments of Wearable Devices Reach 118.9 Million Units in the Fourth Quarter and 336.5 Million for 2019, According to IDC," IDC.com, March 10, 2020.

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