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The Apple Ecosystem:

from the commoditisation of advanced hardware towards a services-oriented industry

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Abstract

The smartphone market is currently facing a period of transition from an innovative, expanding market to a commoditised and mature market. This gradual but inevitable process, common to many technologically advanced markets, will pose new challenges to the companies operating within it. These companies will have to diversify and move towards a services-based business model or face stiff price competition and decreasing profit margins. One of such companies is Apple, which already started its transition towards servitization.

Firstly, we will schematize the concept of business model, and see how the theory applies to the current market scenario and competitive environment.

Secondly, we will analyze the current market trends, highlighting the saturation and maturation of the industry, with a particular focus on the Chinese market and its particular competitive environment, while also drawing comparisons with similar markets of advanced hardware which followed the same cycle in the past. It will be possible to see how the market is characterized by a strong downward pressure in pricing and decreasing returns of a technological innovation strategy as a mean of competitive advantage.

Subsequently, we will list the advantages of servitization and of services-based ecosystems over a more traditional model, with the particular marketing mix necessary to effectively put in action a servitization strategy and the economic-competitive advantage such a strategy can offer Apple.

Finally, we will examine Apple's current service strategy and the possible expansion routes it is taking and it could take to increase its market share and revenues in this industry.

Business Model Theory

A business model is a system which arises from the answers to three "fundamental" questions pertaining to the business of a company. According to Peter Drucker, one of the most important business management theorists, these three questions are:

1. Who is the customer?
2. What does the customer value?
3. How can the company provide this value to its customers, at an appropriate cost?[1]

The answer to these three questions is also known as the *value proposition* of the company, which is the core around which the entire business model is developed and the main "engine" of the company's profitability (or lack thereof, if its value proposition is not well delineated).

This concept can then be further explored, but it is fundamental for a company to be able to provide a coherent answer to these three questions. Once a company has identified a target market, it must recognize (and, if possible, influence) the expectations and desires of its customer segment, and then create a value proposition able to satisfy its customers and sustain its business.

In fact, every kind of organization *has* a business model, although it may not be approaching its business structure in a conscious manner or managing itself along an explicit and coherent business model as identified by the management of the company. The lack of a well-defined business model would put a company at a serious disadvantage when compared to its competitors, as understanding the underlying mechanisms maintaining an organization is fundamental to design a profitable and long-term sustainable business venture.

Indeed, one of the important aspects of a business model is its role in explaining the critical mechanisms governing a company, as to compare it with existing and possible competitors, identify new markets and synergies, and in general be a source of strategic advantage.

One can identify four main categories within a business model. In these four main categories (*strategic choices, value network, value creation, value capture*[2]) can then be listed the single elements and characteristics of the organization.

[1] Adapted from a definition by Peter Drucker from *Economia e gestione delle imprese*, fifth edition (McGraw-Hill Education)
[2] Shafer et al. 2005

Strategic elements	Value network
Target market (customers) Value proposition Capabilities and competencies Revenues and pricing Incumbent and possible competitors Outputs Strategy Branding Mission	Suppliers Customer information Customer relationship Information flows Product or service flow
Value creation	**Value capture**
Resources and assets Processes and activities	Costs Financial aspects Profits

Following a coherent logic, the company must take strategic decisions to create value for its customers and design ways to capture the returns created by fulfilling the targeted need of its clients. In this scenario, the business model is a representation of this logic for the purpose of easier examination and comparison; when lacking a well-defined business model, the firm will not be able to effectively deliver and capture value, ultimately failing to be sustainable.

It is important to understand that sustainability, in this context, means the ability of the company to produce value for all the stakeholders involved in its processes, including the target market, its shareholders, and more broadly the economic, social, and environmental contexts in which it operates.

The Business Model Canvas

Modern business model theory has oriented itself towards a “nine building blocks” system to represent a business model. This system, developed by Alexander Osterwalder (a Swiss business theorist and consultant), is known as the Business Model Canvas. This graphical representation of the business model of an organization is a fairly recent development in management theory (it was first proposed by Osterwalder in 2005 and was released in 2008) but has already been applied and adapted to different business scenarios, demonstrating the viability of its core structure and logic.

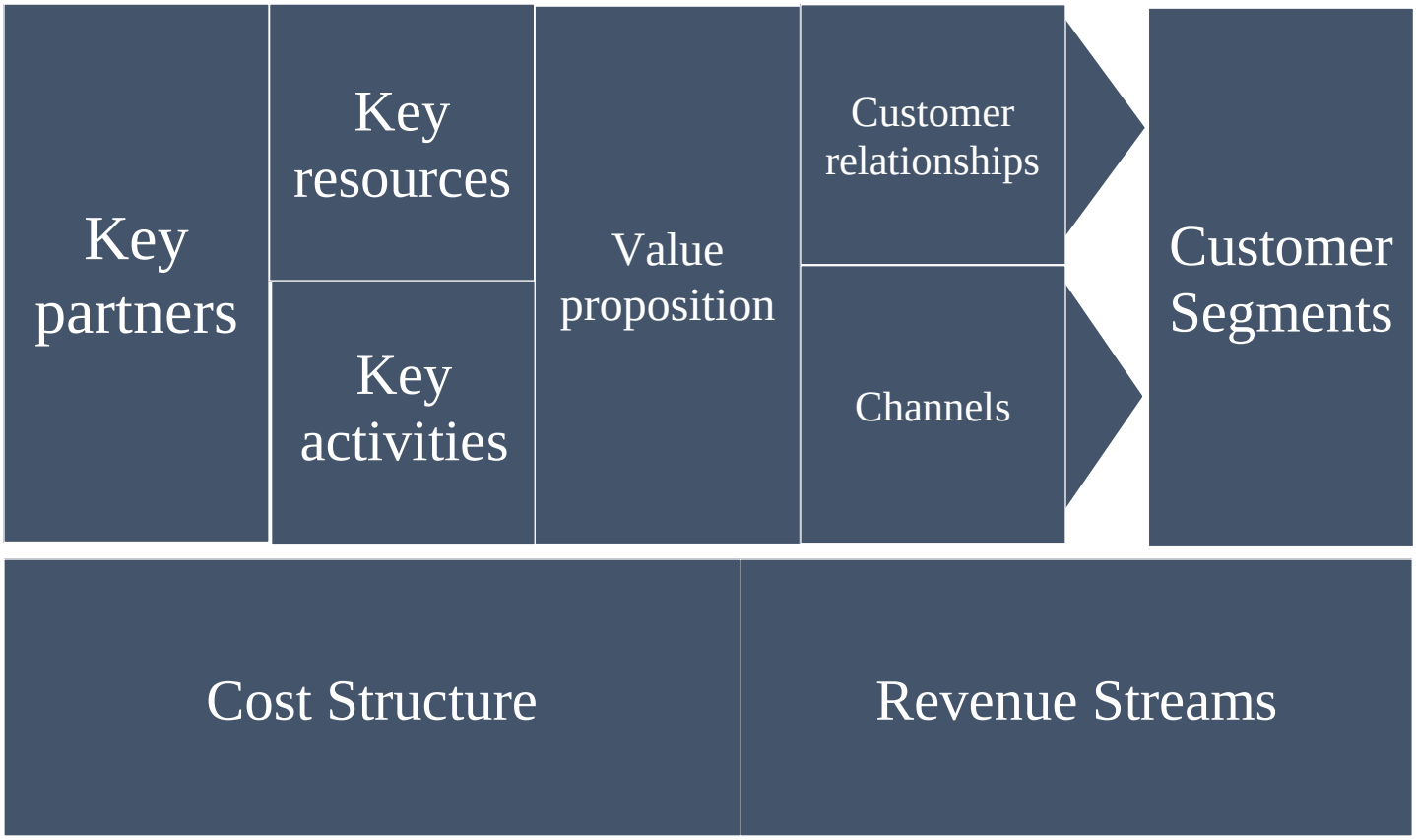
It is designed for a practical approach, as it is easily readable and can be “filled in” by members of the organization as a way to understand the company’s strategy and operational environment; it can be printed on a large surface and completed with post-its, encouraging a creative and engaging approach to business management. In just a page it can rapidly and intuitively represent even complex business strategies or environments.

In the Business Model Canvas, these nine building blocks cover the main business areas of the company, and the logic of the interactions between these components explain the core logic driving the company's strategic choices.

The nine blocks are as follows:

1. Value Proposition
2. Customer Segments
3. Distribution Channels
4. Customer Relationships
5. Revenue Streams
6. Key Resources
7. Key Activities
8. Key Partnerships
9. Cost Structure

When represented graphically, the Business Model Canvas creates a "puzzle" of strategic elements and activities:



In some versions, the Business Model Canvas is expanded to include two additional blocks, representing the wider external situation influenced by the strategic choices of the company and its externalities: *socio-environmental benefits* and *socio-environmental costs*.

Each block represents one or more of the aforementioned elements and activities:

- **Value proposition**: it is the core element of the Business Model Canvas and of the organization itself. It contains all the elements which create a value for the target market. It can be a combination of products and services and their selling characteristics, such as innovation, accessibility, design, price, reliability, customizability, and so on. It is an answer to the target market's needs or problems, and it must be targeted on a specific market or market segment – in this context, the value generated by the company is referred to its customer segments, and does not include society as a whole or the environment for the sake of brevity (when the expanded Business Model Canvas is used, as said before, the socio-environmental benefits and costs of the organization must also be taken into account).
- **Customer segments**: they are the different group of customers (people or other organizations) which the company sees as receptive to its value proposition. The market can be segmented into different target groups when:
    - Their needs and problems justify different combinations of products and/or services.
    - They require different distribution channels.
    - They require a different approach or a different customer experience.
    - They have different expenditure levels and a different elasticity to price.
    - They are interested in different aspects of the same products/services combination.
- **Channels**: they are the means through which the organization can interface with the different segments in the target market. They are both distribution channels (through which the products or services of the company are sold to the final customer) and communication channels (through which the organization can communicate its value proposition and market its offers). They can be directly managed by the organization (for example by having its own stores or direct only delivery) or outsourced to partners (for example by using retail stores, franchises, and so on).
- **Customer Relationships**: it encompasses all the interactions between the organization and its customer base, both during the distribution of its products and services and later. While the company often takes the more active role in its interaction with the client, for example through dedicated personal assistance, the customer base can also have a significant role in business employing a self-service mechanism, or automated services. Customer relationships also

include users communities and co-creation instances; in some cases, the line between consumer and producer can become blurred. Also called *prosumers*, these customers can take an active role in the business model of the company (or platform) they are operating – this is the case for most users of social-networking platforms like Facebook and Instagram, or individuals involved in platforms of the so-called *sharing economy* like Uber and Airbnb. In this case the company provides a platform to foster and facilitate interactions between its users and monetizes the results.

- **Revenue Streams**: they are the activities the organization employs to generate revenues from its customer segments, and together with the Cost Structure form the *profitability proposition* of the company, which must be coherent with its value proposition for the company to be sustainable in the long-term. Also in this case, symmetrically to the analysis of the value proposition explained before, the Business Model Canvas analysis of the profitability proposition focuses on the economic aspects of the company first and foremost. There is a multitude of pricing and monetization methods which can be employed by the company, depending on its business model, but in general they can be divided in *transactional revenues* (the revenues generated *una tantum* by a single payment instance) and *recurring revenues* (such as in subscription services or post-purchase support).
- **Key Resources**: they are the fundamental resources that allow the organization's value proposition to be created, offered to the market, interface with the selected target market and generate revenues. Without key resources, the business model of the company is not sustainable and cannot generate profits. Depending on the business model, there may be several different key resources or combinations thereof; key resources can be *physical* (such as raw materials, production facilities, or livestock), *financial* (for example the monetary funds required for an investment fund), *intellectual* (such as brands or patents), and *human* (usually in knowledge-intensive or creative industries – scientists and artists).
- **Key Activities**: they are the fundamental actions an organization must take to sustain its business model. Following the same mechanism as the key resources, key activities are likewise needed to create the company's value proposition, offer it to the market, include the target market in the business model and finally generate revenue. Also similarly, there can be different key activities depending on the business model; they are usually grouped into three categories: production (needed to design, develop, and produce a good or service), problem solving (to solve a problem afflicting a target market), and platform/network (needed to design, develop, produce, and maintain a platform or supply chain network).

- **Key Partnerships**: while they are external elements and not part of the organization itself, key partnerships are still included in the Business Model Canvas as they are fundamental for the sustainability of the business model of the company. A company can have a complex network of suppliers and manufacturers (Original Equipment Manufactures, OEMs, for example), strategic partners, and joint ventures supporting its value proposition and enhancing it. In general, there are three main reasons for a company to create a partnership relation with an external entity:
    - To optimize its business model and take advantage of economies of scale in production and other activities; the company could reduce its costs by outsourcing part of its activities to its partners or could share part of its infrastructure to obtain more efficient distribution channels.
    - To reduce risk and uncertainty, for example by creating strategic alliances with other companies in a particular area of the industry, while remaining competitors in other areas. An example of this could be the European Battery Alliance, in which different companies collaborate to pool investments for a European battery supply chain (to optimize R&D and reduce costs) while competing in other sectors such as the electrical automotive market.
    - To acquire particular resources or functions; the company could decide to rely on external entities for areas of expertise outside its focus, or could decide to employ third parties to have access to particular resources or markets (for example by creating a joint venture in a foreign market in which the company plans to expand its business).
- **Cost Structure**: mirroring the revenue streams, this area represents the costs incurred by the organization while conducting its business. In a Cost-driven Business Model (such as the one employed by a low-cost company) this area can be extremely important and almost a value proposition in itself, as the strategic goal of such business model is achieving price leadership in its particular industry, so minimizing the cost structure (for example by outsourcing, automating, or restricting the scope of the value proposition) is extremely important and fundamental in ensuring the business model is sustainable in the long-term. On the opposite side of the spectrum, Value-driven business models focus on creating an extremely solid value proposition, notwithstanding the costs that such a goal could generate – this type of business model is common in the high-end segments of a market, and in general in the luxury industry.

It is possible to apply the Business Model Canvas to Apple. By breaking down its business model in the nine blocks, it becomes simpler to understand the motivation behind many of Apple's past and current strategic choices. An example of Apple's Business Model Canvas would look as follows:

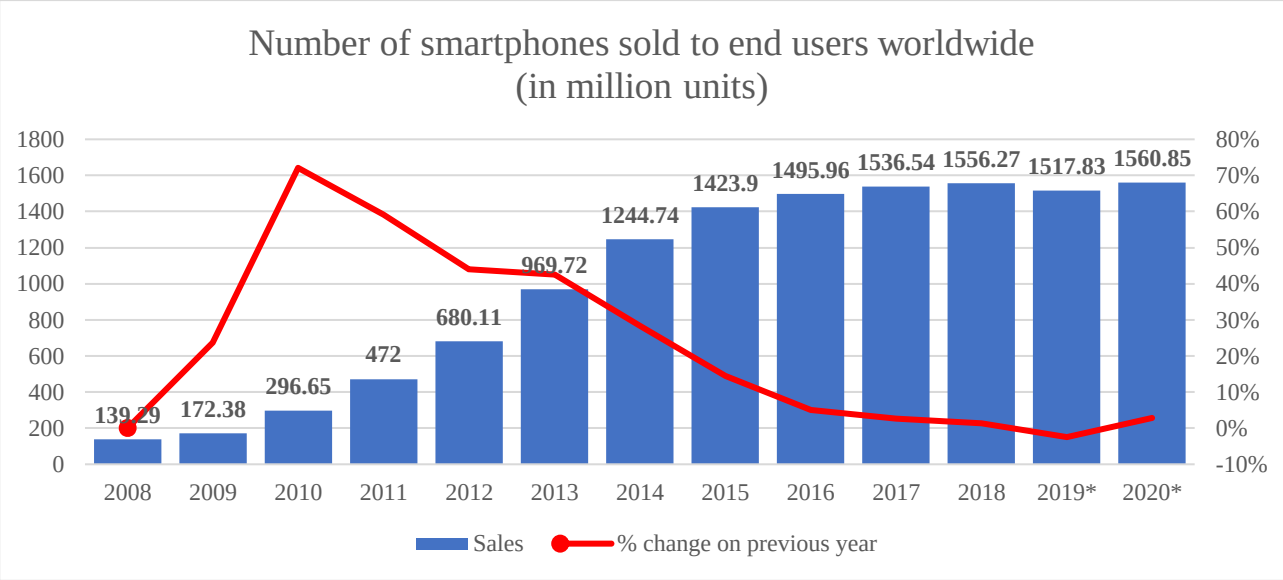
<table>
<tr><th>Key Partners</th><th>Key Resources</th><th>Value Proposition</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr>
<td rowspan="2">OEMs
Suppliers
Developers
Media creators
Startups
Investors
Apple fans</td>
<td>Brand equity
Corporate culture and human resources
"Apple Vision"
Steve Jobs legacy
Intellectual resources
Proprietary software and hardware
Ecosystem
Data management systems
App store</td>
<td rowspan="2">High-end design
Usability/accessibility
Innovation
Uniqueness
Inclusivity
Dedication
Privacy and security
App store support
Online services
Sustainability
Network effect
Know-how</td>
<td>"Apple experience"
Distinctive marketing
Storytelling
Apple fans
Lock-in effect
Post-purchase support
Workshops
Financing
Digital services
Upgrade programs</td>
<td rowspan="2">Mass market
Businesses
Educational institutions</td>
</tr>
<tr>
<td>Key Activities
Hardware R&D
Software R&D
Sales
Marketing
HR management</td>
<td>Channels
Apple stores
Online store
Online services
App Store
iTunes - Apple TV+
Retail
Advertisement</td>
</tr>
<tr><th colspan="3">Cost Structure</th><th colspan="2">Revenue Streams</th></tr>
<tr><td colspan="3">R&D and product design
Sourcing and manufacturing
Outsourcing
Headquarters
Advertisement
Stores and logistical networks
HR management and training
Customer Service
Taxes</td><td colspan="2">iPhone sales (~50% of total revenues)
Sales of other hardware
Sales of software and services
Sales of content and media
Apps and App Store monetization
Subscriptions
B2B support, services and sales</td></tr>
</table>

As we will be able to see, several key components of Apple's revenue stream, the iPhone first of all, are currently being threatened by developments in industry's environment.

Smartphone Commoditisation

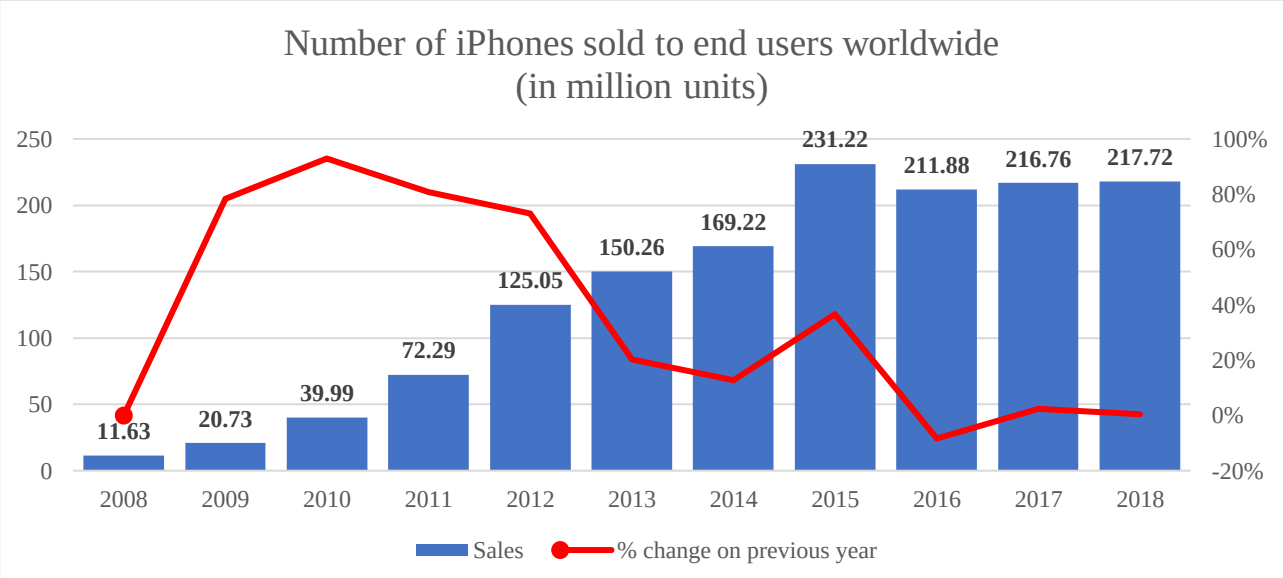
During the last four-five years, smartphones as a product category have underwent a constant process of commoditisation; this process is linked to what can be considered an all but complete saturation of the current market. While sales in this market were able to grow at a double-digit rate in the years following the beginning of the Great Recession, this growth has since plateaued, with smartphones sales in 2020 hovering at around the same level they reached in 2015-2016.

As we can see from the corresponding graph, this decelaration was just as fast as the growth which preceeded it:



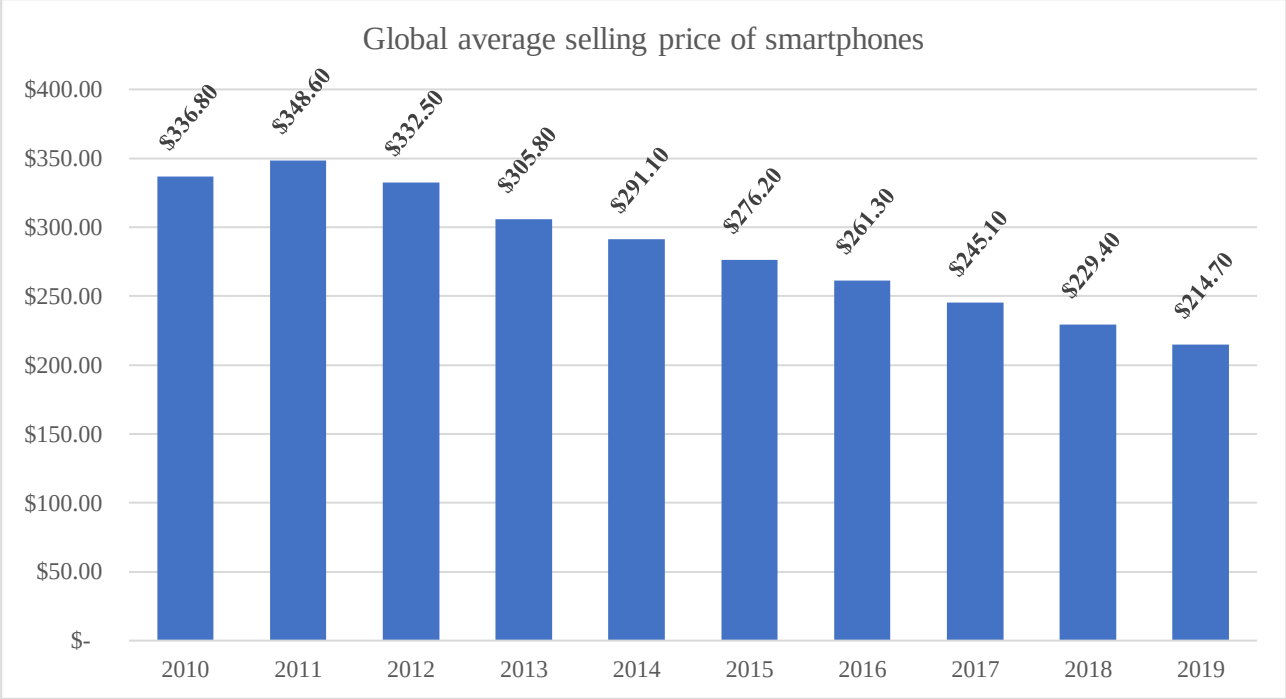
1 Smartphone sales 2007-2020, Statista

Far from affecting only a single company, this trend has been involving the whole industry. Apple's flagship smartphone is following sequentially this same general trend, as evidenced by the iPhone sale figures:



2 Apple Inc. Annual Reports 2015-2020

Meanwhile, the global average price of a smartphone has fallen from $336.8 to $214.7 during the last ten years. This reduction may be partly due to an adjustment made by the industry to meet the demands of new customers in developing countries (mainly China and India); but the fact alone that the industry is now looking at developing countries as its new markets is an indicator that its traditional markets (mostly the USA and EU) are rapidly approaching complete saturation.



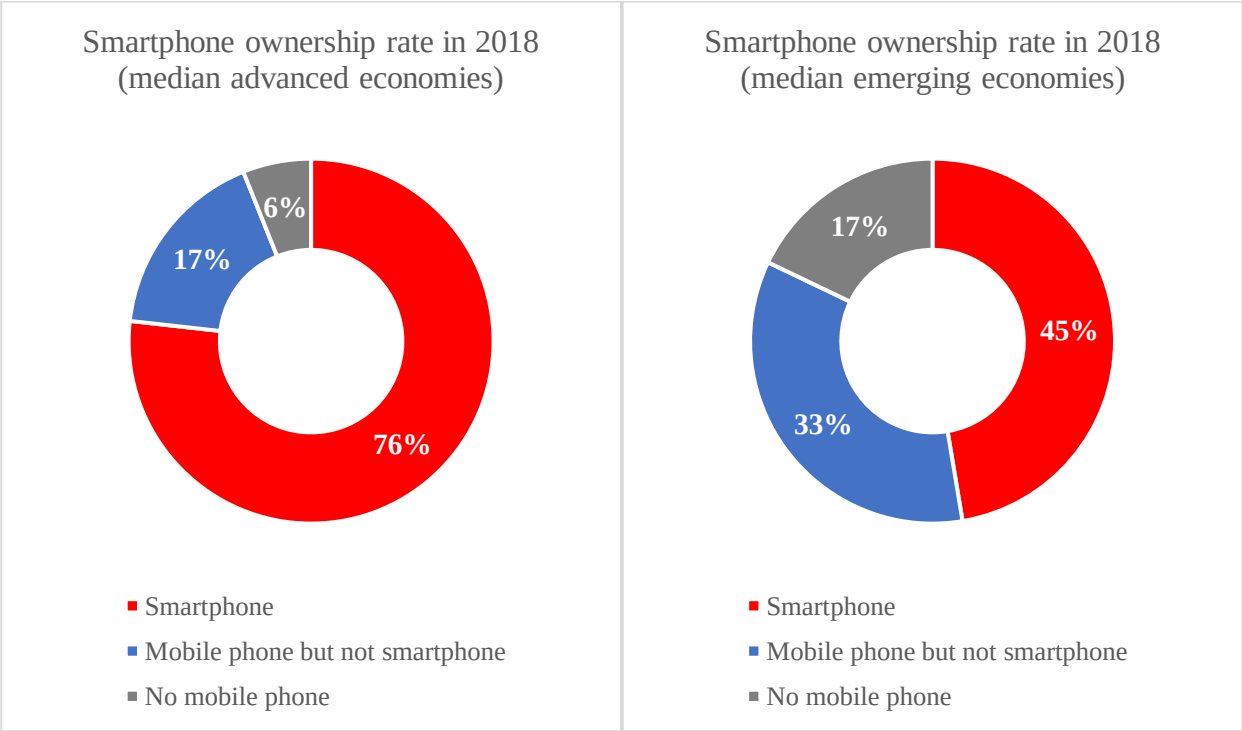
3 Global average selling price of smartphones, Statista

This reduction in the global average price was also largely driven by the entry of other players in the market, with newer regional vendors offering a low-cost alternative to the international vendors that dominated the market in its earlier stages, with Apple obviously being one of the latter.

It is important to note that the industry operates in two markedly different areas: a rich market approaching saturation, currently dominated by a few international players and were brand affiliation maintains a fundamental role in driving sales, and a poorer one, dominated by smaller regional players competing for low margins with largely undifferentiated products in its lower end.

Markets such as India, Southeast Asia, Latin America, and Africa, which have yet to reach full saturation, will however not be the green pastures that the US and Europe were in the early days of the industry, but will instead resemble fierce battlefields were the cheapest smartphones will prevail, regardless of such things as brand recognition and innovative marketing. In fact, the cycle will not repeat itself because the technological fundamentals of the industry have now changed: complete

commoditisation is fully underway. Even in emerging economies, the decrease in the average smartphone selling prices has allowed a significant share of the population to enter this market:



4 Smartphone ownership rate, Statista

The difference in ownership rate is not as large as it could be expected by looking at the median GDP per capita, with several emerging economies reporting smartphone ownership rates on par with developed economies whose average GDP per capita is many times bigger.

Quoting Ben Stanton, senior analyst at Canalys:

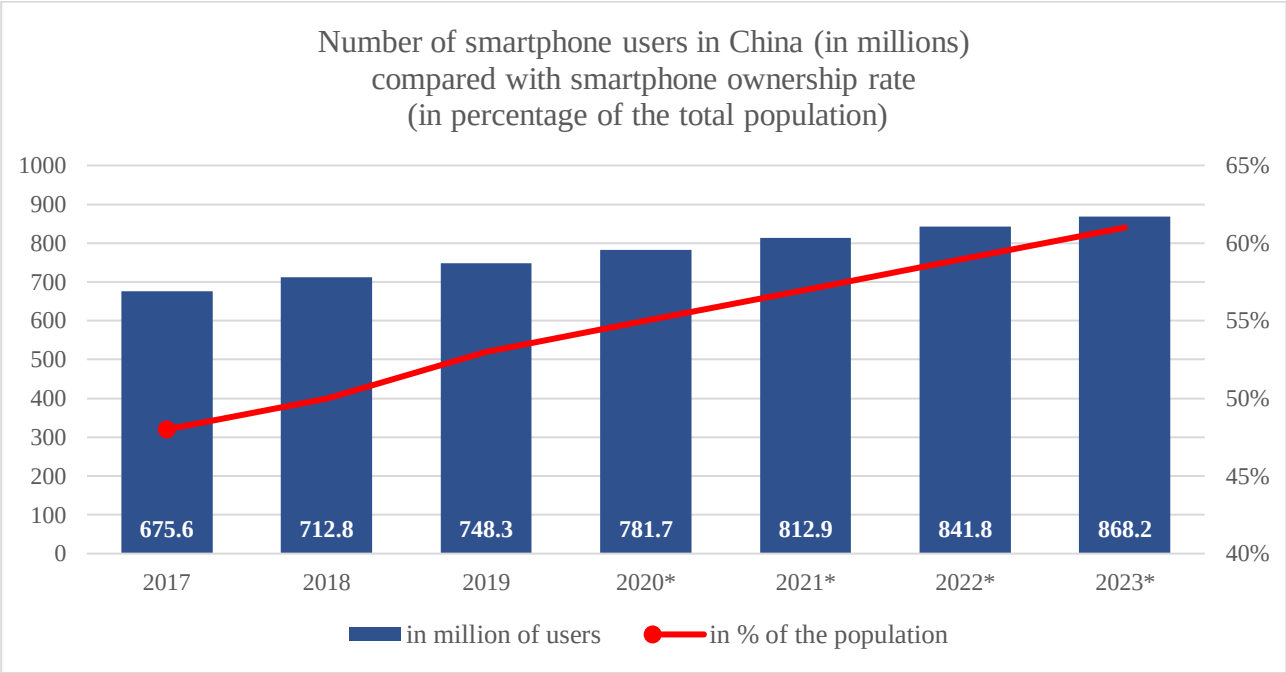
> *"In those markets [emerging economies markets], there are extremely competitive devices down near the equivalent of $200 […] it's a low-margin business and consumers down at those price points tend to be not very brand-centric. That really plays into hands of a few really hyper-aggressive brands of smartphones, most of which are coming from China."*[3]

[3] https://nymag.com/intelligencer/2018/12/global-u-s-growth-in-smartphone-growth-starts-to-decline.html

The Chinese Market, and competitive forces

Indeed, this process is already visible in China, once a developing market and now starting to approach a level of saturation similar to the markets of Europe and North America.

While China is not as homogenous as the West in terms of development (with relatively wealthy, densely inhabited coastal cities and a poorer, more rural hinterland), the Chinese market is largely following the same pattern:



5 Smartphone users and smartphone ownership rate in China (excluding Hong Kong), Statista

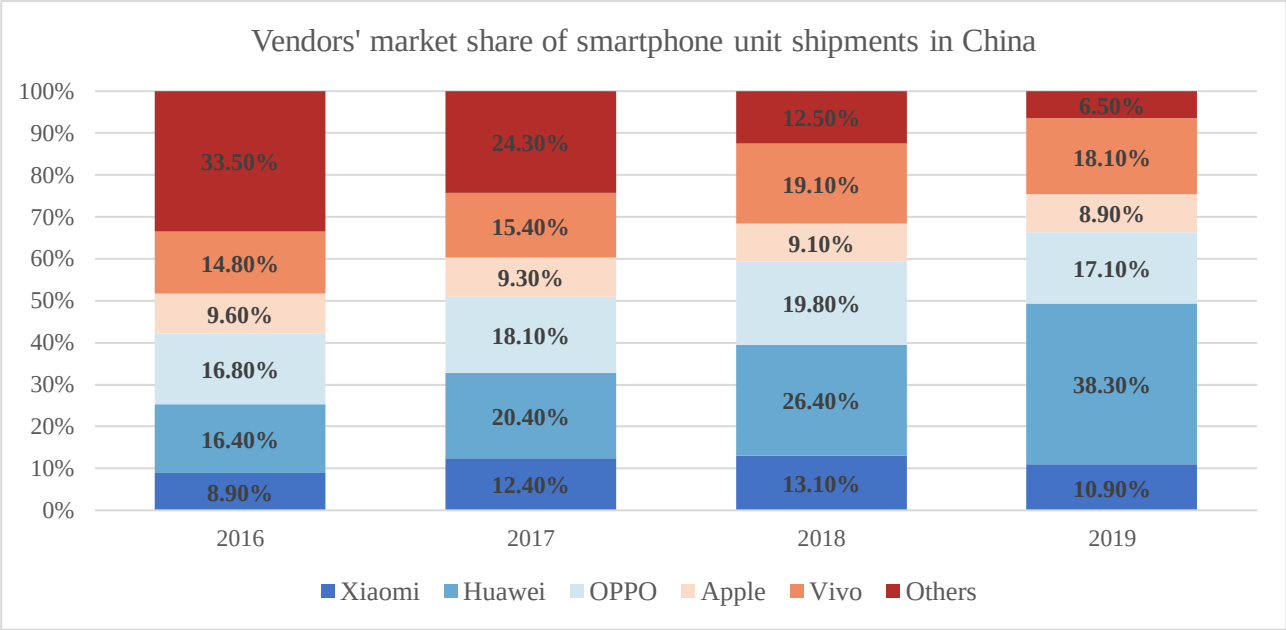
Companies that dominate the global landscape, such as Samsung and Apple, have here a small and constantly declining market share.

Samsung, the world's biggest smartphone producer, was all but driven out of the Chinese market, with a 2019 market share of less than 1% (from a market share of more than 10 percentage points 5 years prior). Android devices are more exposed to this "competition from the bottom", as they can't diversify by offering a different operating system or a personalized ecosystem of services. Apple was able to remain in the market, leveraging its iOS operating system, but its market share is slowly declining as well as newer Chinese-produced models increase their level of technological sophistication.

As we can see in the following graph, some of the biggest players in the Chinese market are small regional players, targeting specifically Chinese customers thanks to a broader portfolio of products, more affordable prices, a software ecosystem targeting the specificities of the Chinese market and extensive local sales channels.

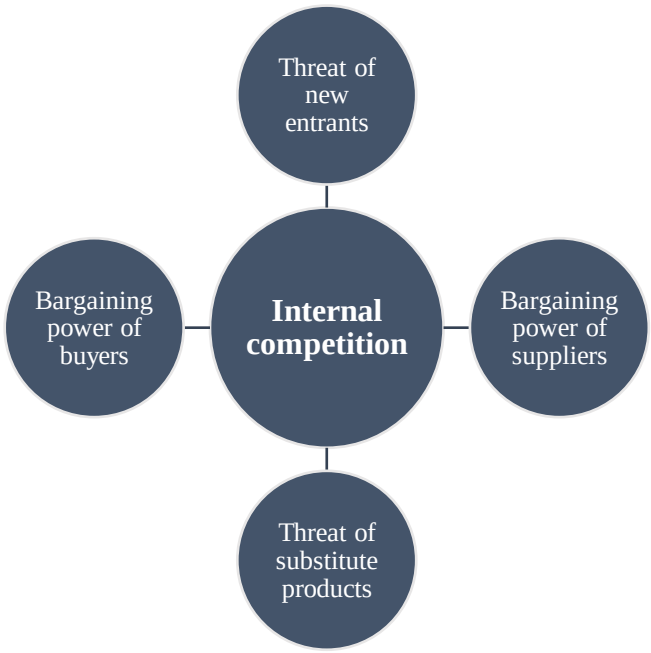
These companies take advantage of locally sourced components and competences, thanks to China's extensive manufacturing capacity, and of a "young", largely brand-insensitive low-end market.

They are now locked in a fierce competition in a trade environment with a strong downward price pressure:



6 Annual smartphone shipments in China (excluding Hong Kong) by vendor, Statista

These conditions can be applied to Porter's traditional "Five Forces" model, used to schematize and analyze the level of competition within a given market. While somewhat reductive, this model can be useful to quickly summarize the state of the industry, the attractivity of the market itself, and the possible strategic choices a company could make:



We can then highlight the strongest competitive forces in the current worldwide smartphone market. As we were able to see, competition in this particular market is currently increasing in all five areas:

- **Internal competition**: far from being a monopoly, in the current smartphone industry already operate a number of existing companies, some extremely well-established like Apple and some new. The decrease in the marginal utility of innovation means that the major companies can offer products able to compete in all the segments of the market, without needing major investments or proprietary technologies to manufacture high-end products.
- **Threat of new entrants**: for the same reasons, it is also increasingly simple for new companies to enter the market. Due to the open-source nature of the Android ecosystem, companies marketing smartphones operating on Android are especially vulnerable to this new threat, as the network effect they take advantage of is also open to possible competitors, removing a significant barrier of entry. Apple is less susceptible to this phenomenon (in the particular industry "smartphones operating on iOS" Apple controls 100% of the market share, for obvious reasons), but new entrants targeting the higher segments of the market could still threaten its position.
- **Threat of substitute products**: there is currently no threat for the market as a whole, as smartphones can't be easily replaced by other products such as personal computers, tablets or smartwatches without a loss in offered value. However, within the market, the threat of substitute products is significant, due to the aforementioned process of commoditisation and the implied decrease in diversification between the models offered by the different brands. Again, smartphones operating on Android are more susceptible to this process.
- **Bargaining power of buyers**: the smartphone industry is in large part a business-to-customer industry, so in this case there is no significant pressure on the buyers' side to influence the competitive environment of the market. However, thanks in part to a degree of interoperability in regard to data storage and software ownership between smartphones, there are no significant switching costs (neither monetary, nor as far as "convenience" is concerned), increasing the difficult of adopting a strategy of vendor lock-in. Likewise, the buyers have an high level of informational availability and it is extremely easy to compare the products offered at all price and quality levels.
- **Bargaining power of suppliers**: economies of scale dictate a certain degree of agglomeration on this side of the industry, especially in areas such a microchip and touchscreen manufacturing, which require high levels of technical sophistication. Although not as relevant when applied to services-based business models (which encourage an in-house production and supply of said services), this is also a competitive force to consider. The

supply of hardware components is hard and expensive to replace, and has been as of lately influenced by geopolitical developments extraneous to the industry itself (see as an example the decision by the American government to restrict Huawei's access to American-manufactured semiconductors, data storage components and networking equipment as part of the ongoing Sino-American geopolitical spat); due to the reality of such extremely complex globalized supply chains, the bargaining power of suppliers (or of the relative governments, like in this case) is an aspect worth appraising, and it is lately becoming considerably unpredictable.

In general, this is not to say that smartphones will not remain a market of great importance, or even a profitable one. But it has clearly entered a plateau, and it may enter a downslope in the following decade.

The main reason why commoditisation is happening in this industry is to be found in the decreasing returns of investments in new technical solutions in the smartphone research and development processes. Simply said, the technological gap between high-end smartphones and the rest is shrinking, and to avoid (or more precisely, delay) this inevitable process it is necessary to invest increasingly bigger sums in research and development.

Smartphone manufacturers seeking to compete in the higher end of the market now have to focus on two main areas: cameras, where high-end products still have the upper hand, and details, such as new security features, extremely high-resolution displays, water resistance, and so on; but these changes are incremental, and new models in the same segment of the market merely improve on their older versions.

Decreasing marginal utility of hardware innovation

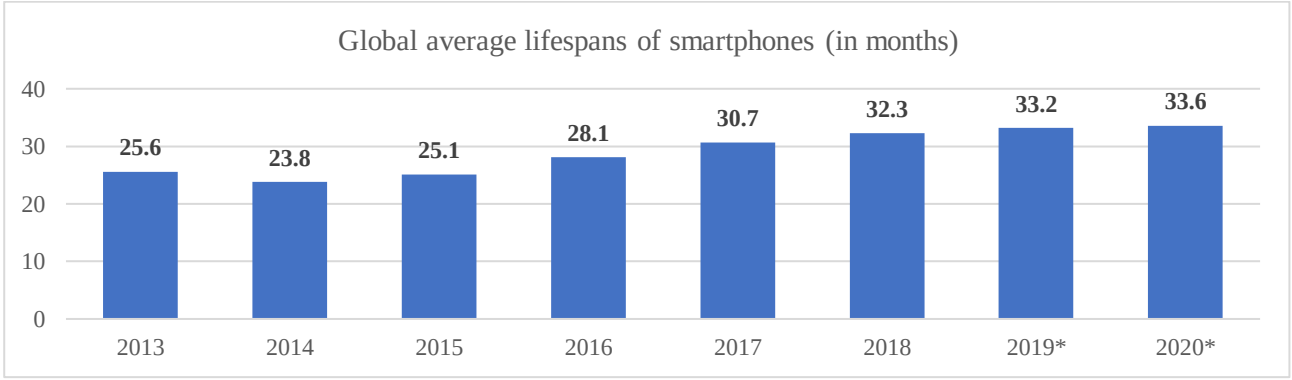
As innovation ceases to be the lever driving customers choices, price (or ecosystems) will become the main selling points of a brand, and companies focusing on those will have more and more space on the market.

7 Average selling price of desktop computers, Statista

Commoditisation is however a normal phase of the life of a product. What we are now seeing in the smartphone industry is no different than what happened in the personal computer industry in the late 90s, and in printers before them: Xerox copiers were once a revolutionary product; nowadays, office copiers are largely undifferentiated (and this nearly bankrupted Xerox), with price driving purchase decisions.

It is realistic to say that in time the same will happen to the smartphone industry, and companies will have to cope with this new market environment. Smartphones that have no software diversification (such as those operating on Android) and have increasingly smaller differences in hardware and technical features will have to mostly compete on price, further accelerating commoditisation.

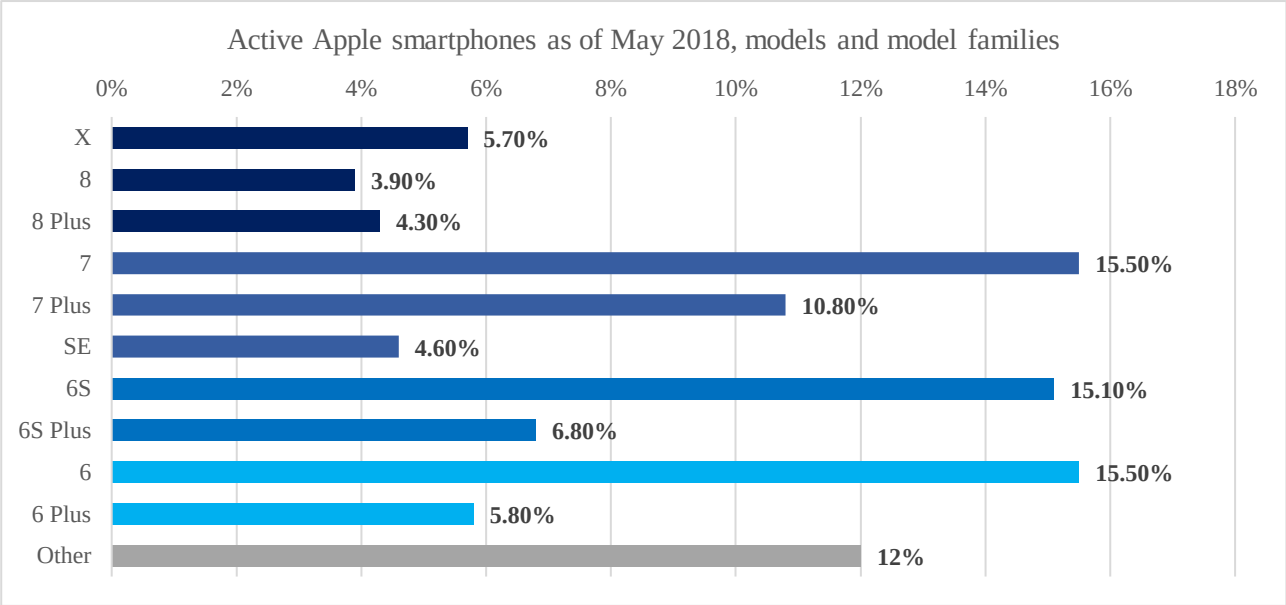
As the rate of innovation decreases, it becomes increasingly more difficulty to justify the purchase of a newer smartphone model (upgrading). Because smartphones are more durable than ever, and features such as water and dust resistance have become the standard, they break less often, and so they don't need to be replaced nearly as much as in the past. Their processors are also powerful enough to handle the common day to day necessities most users task their smartphones with.
Indeed, the average life cycle of most smartphone has been steadily increasing over time:



8 Average lifespans (replacement cycle length) of smartphones worldwide 2013-2020, Statista

High end smartphones are being replaced more rarely; curiously, while this is a general trend, there seems to be a stark difference between Apple and Samsung users in how they choose when to replace their phones – probably because of Samsung's focus on developing markets such as India and Pakistan.

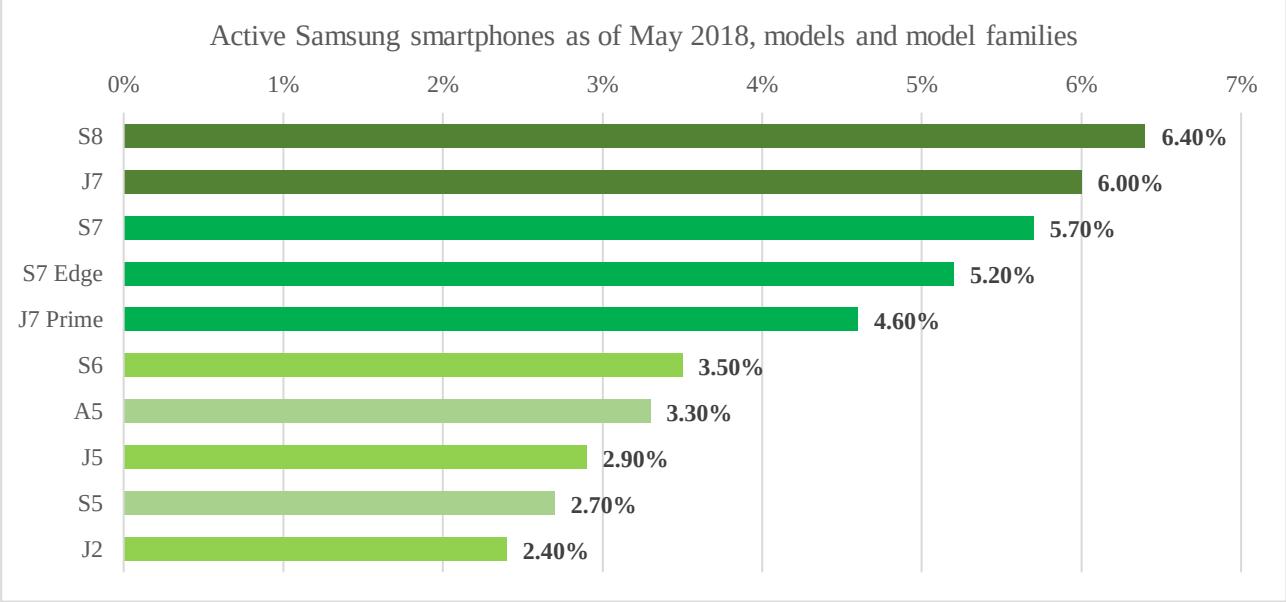
Apple users seems to be attached to particular iPhone models, and upgrade them more rarely:



9 Performance of Samsung and Apple flagship smartphones, Newzoo.com

It is possible Apple's higher average prices and more dedicated post-purchase customer support are playing a role in these decisions.

While, on the contrary, Samsung costumers tend to go for the newest available models and upgrade more frequently:



10 Performance of Samsung and Apple flagship smartphones, Newzoo.com

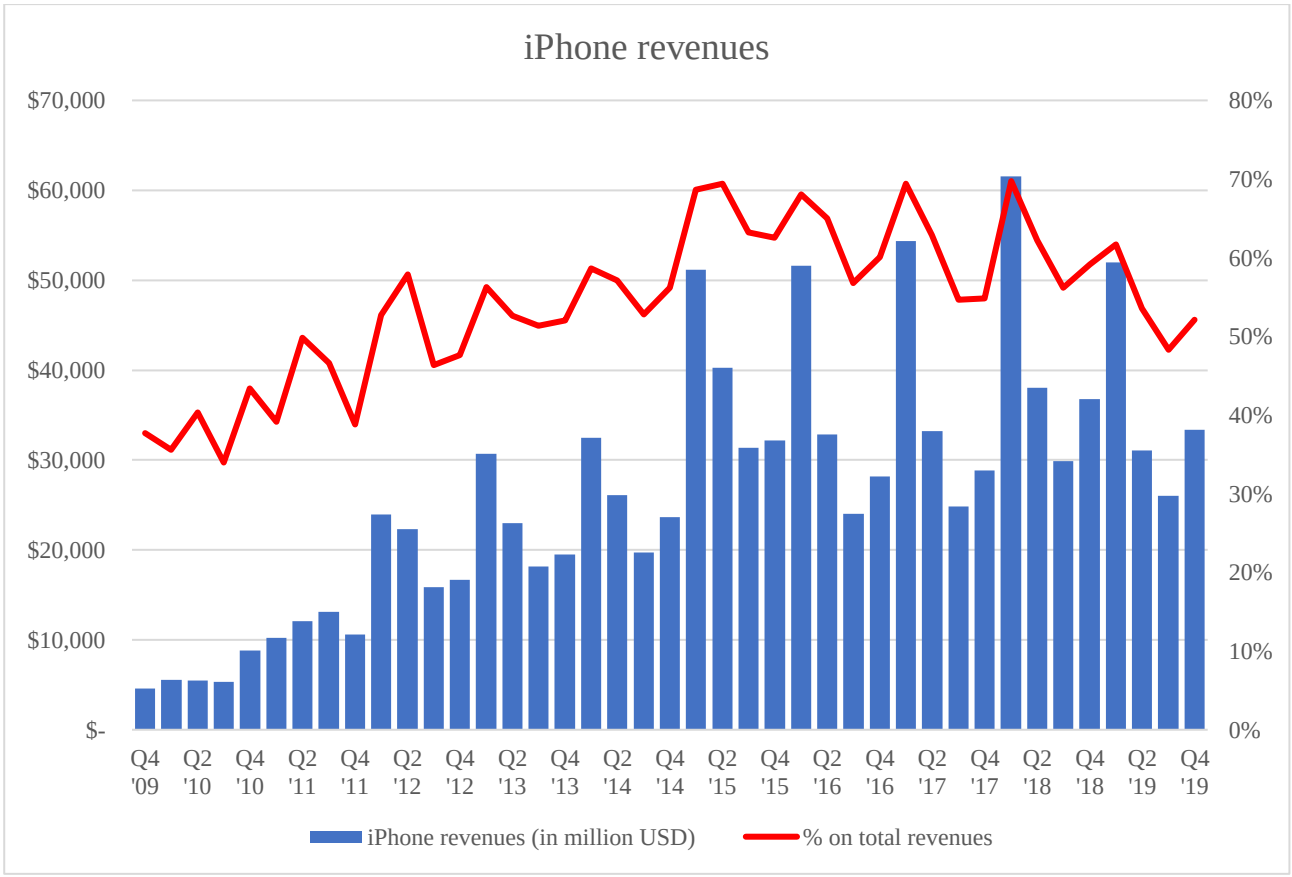
Today, according to a survey conducted by Statista (2020), the number one reason to buy a new phone has become "to replace a broken one". This is bad news for companies trying to sell their "new shiny thing", and unless foldable phones will become the huge success Samsung hopes they will be, that is not going to change any time soon.

Apple and commoditization

But where does Apple stand in this changing industry? The iPhone has been increasing in price in the last few years; making the phones themselves more expensive may seem like a solution: fewer iPhones sold mean that in order for revenues to not decline, the price must increase. But trading higher prices for a lower volume of products sold (essentially becoming a luxury product) can be a dangerous game.

Profit margins on iPhone products have already be declining for years, and even steady profits would be a worrying sign when total sales are declining. For a product that makes more than half of the total Apple revenues, it is problematic.

As we can see, iPhone sales have a decreasing importance in Apple's total revenues:



11 iPhone revenues, Apple Inc. Quarterly Report 2020

Simply increasing prices is a tactic that could suffice only in the short term and may even damage the company in the long term. Losing production volume will lead to losing economies of scale in the production process but more importantly it will jeopardize the network effect Apple enjoys today, one of its main advantages over its competitors, and indeed one of the most important advantages for any company trying to create a maintain an ecosystem of products and users. In fact, the success of the iPhone SE 2020 could be a signal that Apple users themselves are increasing drawn by Apple's ecosystem of services and operating system more than by the actual smartphone hardware.

Without the benefits of a network effect on which to build an ecosystem of services, Apple will struggle to maintain its current market share. This is already visible in the current market situation: Apple is more successful in markets where it enjoys a large network effect due to the number of iPhone users, but it is less attractive in newer markets where there are few or zero positive effects due to the lack of diffusion of Apple products, not enough to justify the iPhone's premium price tag. A large number of iOS users, active in the Apple's ecosystem of products, will be fundamental in building a profitable long-term strategy of servitization.

A Services Ecosystem

Before analyzing Apple's transition towards a services-based business, it is important to first understand what a service is (in economic and business terms) and what are the advantages of the services industries compared to the more traditional manufacturing industry in which Apple was, and still is, primarily competing.

A comprehensive definition of services could be:

> *Services are economic activities performed by one party to another. Often time-based, these performances bring about desired results to recipients, objects, or other assets.*
> *In exchange for money, time, and effort, service customers expect value from access to labor, skills, expertise, goods, facilities, networks, and systems. However, they do not normally take ownership of the physical elements involved.*[4]

In general, the main strategic elements necessary to market manufactured goods are the so called "Four Ps" of the marketing mix (*product, price, place,* and *promotion*):

1. **Product**: quite intuitively, the product (a physical product, in this case) which the company is trying to sell. To design a product, the company must take in account the information related to what advantages the product can provide to the target market, and how these advantages will solve the target market's problems and fulfill its needs. It also needs to regard a number of considerations related to this target market (defined by its segmentation along demographic, behavioral, attitudinal, psychographic, and expenditure criteria), such as how and how frequently will the target market use the aforementioned product, when it will be replaced, by what it could be replaced, what the target market could do if the product was not available, and so on.
2. **Price**: it is the only element which generates a positive cash flow for the company. All the other elements in the marketing mix are primarily conceived to market the product, and as such are characterized by a negative cash flow (essentially, the company must invest part of its capital to market its products).

[4] Adapted from a definition by Christopher Lovelock, from *Services Marketing*, eighth edition (World Scientific Publishing Inc.)

3. **Place**: the channel (or channels) by which the product is distributed to the customer. It is important to consider which channel is the most used by the target market for the specific kind of product the company is offering, what level of penetration in the market can reliably be achieved, if it is possible to supplement a main channel of distribution with alternative channels, what kinds of additional mechanisms the organization must develop (internal or out-sourced) to support this channel of distribution, and so on.
4. **Promotion**: the customers in the target market need to be aware of the company and its product in order to be able to become customers. Promotion is the channel (or channels) the company can use to create awareness in the target market. Promotion can be direct (for example through flyers or e-mails) or indirect (for example through TV advertisement); promotion can also be targeted and customized specifically for a single customer or customer segment, thanks to the availability of customer data and the possibility to reach the target market through social media advertisement or interactive advertisement. In this category are also included considerations about the impact of existing promotion strategies, the reachability of existing and potential customers, the relevance of promotional campaigns, and so on.

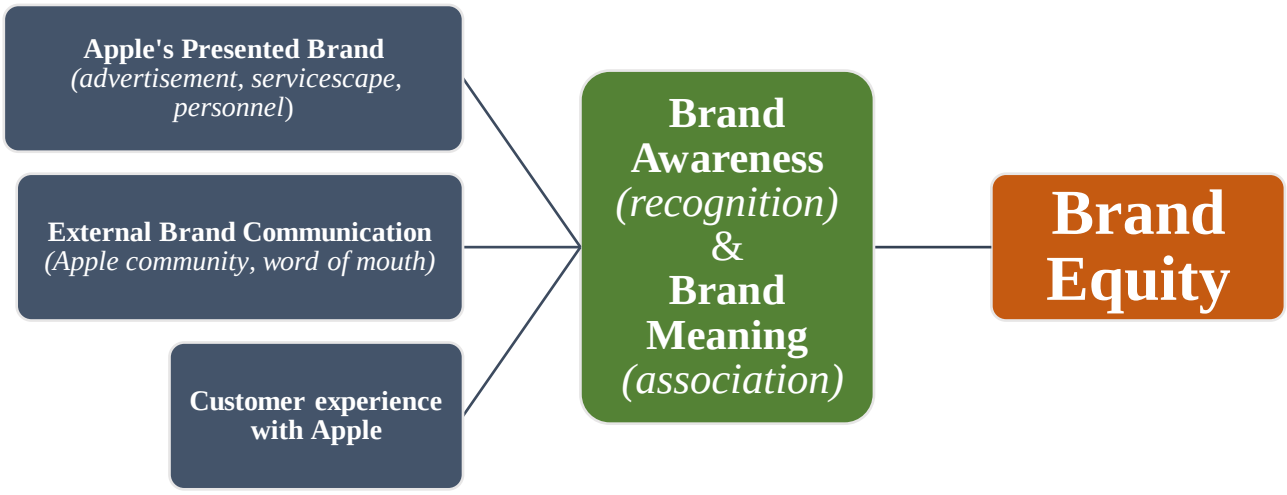
It is fundamental to understand that the Four Ps always have the center the target market, which always is the central focus of any marketing campaign.

In this case however, alongside these four traditional strategic elements, it's necessary to introduce the elements associated with service delivery, which is fundamental in a services-based industry: these are *process, physical environment,* and *people*.

Apple is uniquely posed to take advantage of these additional "Three Ps", and more specifically of the latter two:

5. **Process**: Apple can easily control the quality of its operational output, as its services are offered mostly through its proprietary apps. In this category the customers can be considered "partial employees", as they are involved in the successful fruition of the services Apple offers (from its App Store to Apple TV).
6. **Physical environment**: Apple stores are designed to offer more than a simple shopping experience, creating through a combination of servicescape and careful employee training a unique "Apple" experience, where the customer can feel welcome and be more receptive to Apple's marketing. In this category it's also possible to include the "digital environment" in which Apple markets its services: with its proprietary iOS, Apple can offer a better targeted experience by controlling the entire value chain of its digital services. Note that this element differs from the *place* of the traditional marketing mix, as it is focused on the presentation of the place itself, i.e. its physicality in the interaction with the customers, instead of being about the "channel", i.e. the mechanism thanks to which the manufactured product is distributed to its end users.
7. **People**: by careful training and selecting its employees, Apple can even more control its services output. With initiative such as the "Hour of Code" it also aims to further engage its customers (in this case younger children interested in coding) to enrich their shopping experience.

Apple can take this holistic approach already in place for its marketing strategy and integrate it with a robust offer of non-physical products and services, further building on its already extremely valuable brand equity (the marketing advantage the company has over its competitors), which can be graphically summarized as such[5]:



The transition towards a services-dominated business and its advantages

With the progressive reduction of profit margins in the more traditional hardware market, coupled with increased competition and dwindling sales, it is understandable how Apple has decided to implement an integrated strategy to re-engineer its core-business towards a software market and, more generally, towards a services market.

This transition must be seen in the wider context of a general transition of the global market from industrial manufacturing to a services-based economy: today the services industry generates almost 65% of global GDP, rising to the 74% of the GDP in the most advanced economies[6]. The advantages servitization can bring to the smartphone industry are indeed present in most industries in the developed world today.

Servitization offers three main sets of advantages when compared to a strategy focused solely on traditional manufactured goods. Most importantly, these advantages can be built upon a foundation created with said manufactured goods, increasing revenues for the company as a whole but also strengthening their competitive advantage.

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[5] Adapted from from *Services Marketing*, eighth edition (World Scientific Publishing Inc. Co.)

[6] Data from World Bank (https://data.worldbank.org/indicator/NV.SRV.TOTL.ZS), accessed 2020

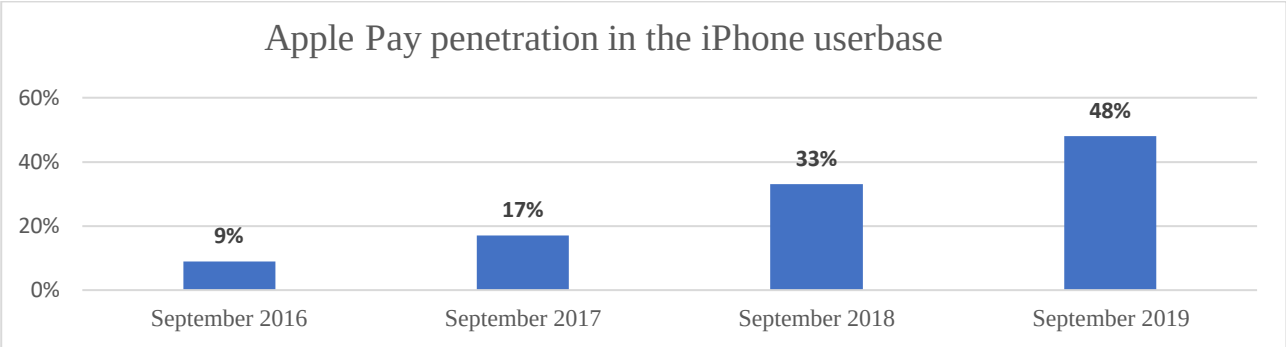
As analyzed by Tim Posselt in *Organizational Competences for Servitization*, these advantages can be summarized in three distinct sets of arguments: economic, strategic, and marketing-related.

Firstly, a combined product-service offer can generate revenues from an already matured market by building on the advantage created by the existence of a large and well-established userbase. This is especially useful for firms whose products are characterized by a longer life cycle (not coincidentally, automotive and aircraft manufacturers have already bet on the advantages offered by servitization), and we were able to see how the smartphone market is largely mature and most smartphones enjoy increasingly longer life cycles. Services in general also allow for higher margins than traditional physical goods, as it will be evident by analyzing the margins of Apple's different sources of revenue. Software services are also more easily scalable than traditional products, as they don't need the same kind of industrial and logistical support infrastructure to ensure adequate supply.
Furthermore, during adverse economic cycles services offer greater resilience than physical products, as customers tend to become more cautious and prefer to extend the life cycle of the products they already own, increasing the relevance of the previously explained mechanism by driving down sales of new products and relying on the services offered by previous purchases. It is also possible that, in the future decades, an increasingly environmentally friendly customer base could decide to furtherly extend the life cycle of its products as a mean of decreasing its environmental footprint for ethical reason; a similar trend could be encouraged by environmentally conscious policies such as the EU's so called "right to repair".

Secondly, by acting as a mean of diversification from the competition, services can help offer a competitive advantage, especially in markets characterized by constant commoditisation, where maintaining technical leadership and price advantages can become increasingly unsustainable (as we have seen, all these trends are currently present in the smartphone market, as with every hardware market). As companies operating in the same market start offering differing bundles of services, the customers can begin to consider such services as "customizable" features to differentiate even products perceived as largely commoditised and homogenous. As services are also harder to imitate than physical goods, a focus on servitization creates significant barriers to competitors threatening the market share of the company and increase the advantage of an already established customer base.

Thirdly, as services are characterized by longer fruition periods (in the form of subscriptions, for example), the company can ensure a continuous contact with its customer base, creating a marketing advantage over its competitors and using its services ecosystem as a driver to increase the sales of its

other products. In the same way, the ability to market directly to Apple's established userbase can facilitate and speed up the adoption of the firm's new services:

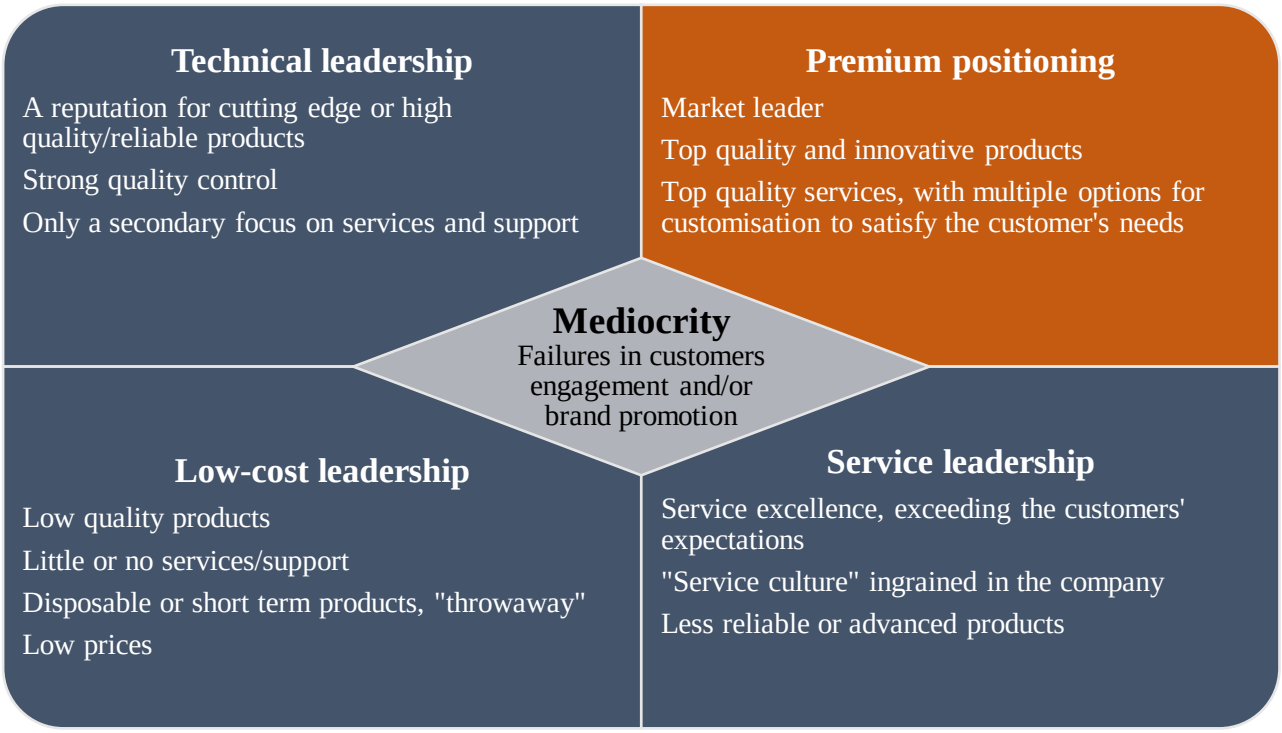


12 Apple Pay penetration in the iPhone userbase, Statista

Furthermore, instead of a single, *una tantum* purchase, customers in a services-driven ecosystem are constantly engaged with the firm, which can create a more customized, intimate, and long-lasting relationship with its customer. The company can then market personalized bundles of offers to ensure a long-term revenue stream.

Product service positioning

It is however important to reiterate that Apple is not exiting the physical products market. As of now, it is supplementing it with an increasingly rich ecosystem of services, which indeed in the future may become the main focus of the company, but a servitization strategy will be the more successful when an holistic business approach is employed, an approach which considers the synergies existing between an offer of traditional hardware products and its connection to a software-based and services-based value multiplier. To this it is possible to reference the "Product service positioning (PSP) Matrix", developed in 2016 by Carol-Ann Morgan from B2B International[7]:



In this matrix, the y axis represents *product superiority* (with characteristics such as reliability, innovation, uniqueness) while the x axis represents *service superiority* (with characteristics such as quantity, quality, availability). By combining in an holistic approach these two vectors, Apple can position itself in the upper-right corner of the matrix.

[7] Adapted from a model in *The Business models handbook – templates, theory and case studies*, first edition (Kogan Page ltd.)

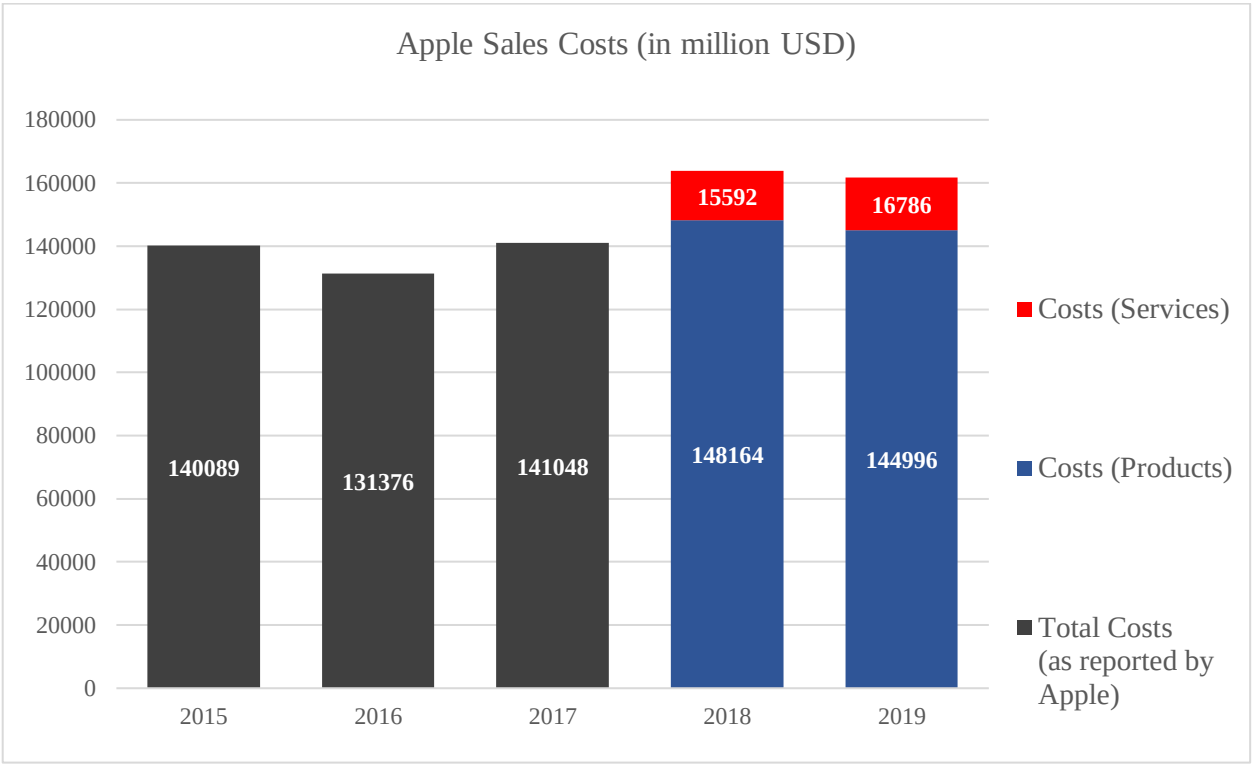
This framework can be further expanded to analyze possible threats and opportunities for the four models:

	Premium positioning	Technical leadership	Service leadership	Low-cost leadership
Main investment targets	Brand People Products Processes to ensure high quality and innovation	Product development Innovation Production processes Supply chains Product quality testing Suppliers control	People and processes Culture of service "Customer first" approach	Cost leadership Supply chain and delivery channel efficiencies
Ability to charge premium	Very high	High to very high	Moderate to high	None
Long-term sustainability issues	Ensure customer expectations are met The premium market must be big enough to sustain the company	Ensure the product outperforms competitors Long-term innovation sustainability	Ensure a culture of service is maintained amongst the staff Manage the cost of service back-up for products	Ensure operating costs are kept under control Accurate cost of sales data
Long-term threats	Cost to serve exceeds the premium tolerated by the market Poor reception from the customers	Commoditisation Product innovation too slow or expensive New entrants	Poor product performance Poor reliability	Spiral of low pricing reducing profits for long-term reinvestment in the company

The main long-term threats for a "technical leadership" company are commoditisation, a reduction in the marginal utility of innovation, and new entrants in the market. All these elements are currently threatening the top players in the smartphone industry, as seen before.

Financial data analysis

It is then not surprising to understand why, since a few years ago, Apple has started to re-orient itself to prepare for a transition to a more services-oriented business model, decreasing costs and increasing revenues:



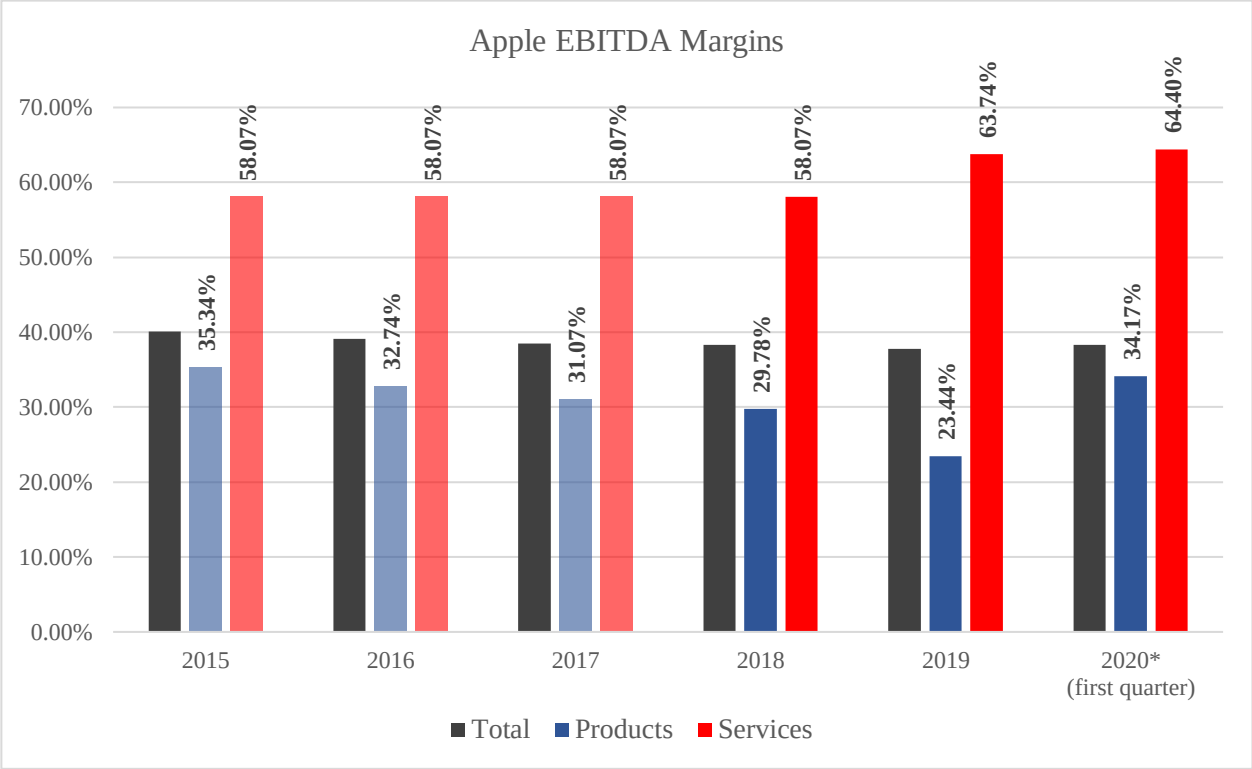
[8]

13 Apple Annual Financial Data, Apple Inc. Annual Reports 2015-2020

Services, which is Apple's case are mostly software-based or entertainment content, have much lower marginal costs (the increase in the total cost which arises when production is incremented by one unit) when compared to physical products. In fact, once an App or other software solutions have been developed, they can be replicated and scaled to be purchased by any number of users with much lower costs that would be required by, for example, producing additional units of iPhones.

[8] It is noteworthy by itself that Apple did not initially include a goods-services breakdown in their Sales Costs but started doing so from 2018; I believe this is another indicator of the growing importance this specific sector has now acquired in Apple's financial calculations specifically, and in the company generally.

As we have said, advantage of services over more traditional products in Apple can be made evident by analyzing the trend of their corresponding earning margins:



[9]

14 Apple Annual Financial Data, Apple Inc. Annual Reports 2015-2020

Apple's margins have been in a slightly decreasing trend in the past 5 years; once these margins are broken down according to their corresponding categories, it is evident how only a constantly growing services category is counterbalancing the (slightly) negative trend in products earnings.

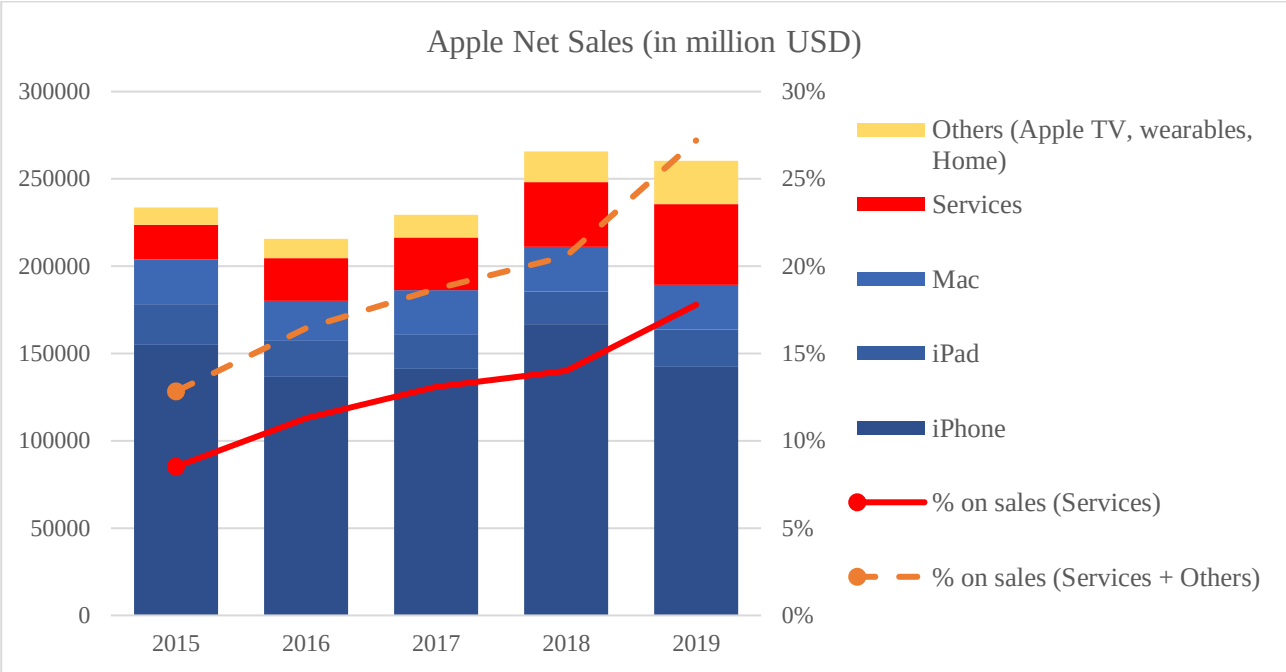
The percentage of services sales on the total Apple sales has almost doubled in less than 5 years, and it is expected to grow much more. In 2019 services revenues (including income from the App Store, iTunes, Apple Music, iCloud, Apple Pay, and Apple Care) are already worth more than the Mac and iPad *combined* in Apple's balance sheet, which are some of its most popular and recognizable products.

[9] Again, Apple did not include a goods-services breakdown in its reports prior to 2018. EBIDTA Margins 2015-2017 are estimated, keeping as a low default baseline the corresponding 2018 Services Margins (realistically, the results are even more pronounced).

The equation used is $\frac{(\sum Products\ net\ sales) - \ products\ costs}{\sum Products\ net\ sales}$, as visible in the corresponding .xlsx file.

Note that the 2020 data are considering a quarterly period ending December 28th 2019, and thus are necessarily distorted by the inclusion of goods sold during the Christmas Period and reasonably not indicative of changes in the 2020 annual situation. All other data are derived from Apple's Annual Financial Reports, as before.

Indeed, services in sales are increasing both in absolute and relative terms:



15 Apple Annual Financial Data, Apple Inc. Annual Reports 2015-2020

A decrease in product sales can be problematic because Apple takes advantage of a process known as a positive network effect. Simply put, the value of an Apple products grows proportionally with the number of other products and users corrected to the network.

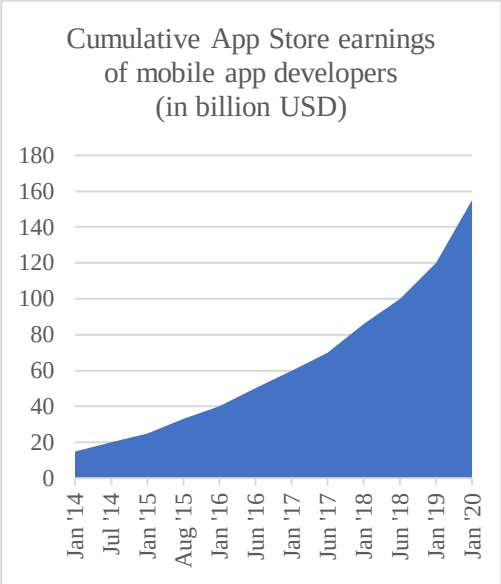
The Network effect

Network effects are common in ecosystems which involve some kind of interaction between the users benefitting from the good or service. For example, the more users own a phone, the more valuable the phone is for the individual customer, who can call an increasing amount of different people. Similarly, social networks and online video games benefit from the network effect, as when more people are connected to the services the more engaging the platform becomes.

In a way, the value of a userbase in which a positive network effect occurs is superior to the sum of its singular components. The mechanism at the base of a positive network effect can be summarized as the Metcalfe's law, named after the inventor of Ethernet, Bob Metcalfe:

> *The effect of a communications network is proportional to the square of the number of connected of the system: n^2.*

Network effect can mainly be categorized as direct, indirect, or intra-personal. All three are present in the Apple ecosystem.



16 Cumulative App Store earnings, Statista

In a direct network effect, the positive value is correlated with the number of communicating users utilizing a product or service connecting them. In Apple's case, iMessage is an example of direct network effect: iPhone users can send messages for free to other iPhone users; the more iPhone users in the network the more useful iMessage becomes for every one of them.

In an indirect network effect, a symbiotic product or service (or another network) grows together with the main network, which increases its value. In return, the symbiote offers a source of utility to the users of the main network and improves its benefit, in a so-called positive feedback loop – the network improves the symbiote, and vice versa.

In iOS, and in other operating system, an indirect network effect is generated by third party apps available on a dedicated main-network platform (in Apple's case, the App Store). App developers offer new services to iPhone users, increasing the value of this product, and in turn have access to Apple's userbase and often dedicated support and marketing by the company, which is interested in cultivating an integrated relationship with the developers and app creators.

Additionally, Apple products are designed to operate within a closed software ecosystem of compatible devices: a shared cloud infrastructure, iCloud, allows users to be largely hardware-independent in the way they save and share their data, and offers additional services (like for example the possibility to locate lost devices); proprietary software also allows Apple to create a tighter fit between its different products, offering higher performances and faster syncing than products operating on an open network such as Android.

This way, Apple users are encouraged to buy and use more than one Apple device, to fully take advantage of the ecosystem Apple provides. Thanks to this intra-personal network effect, a single successful product can then propel the sales of the entire network.

Indeed, another important consequence of a well-developed ecosystem of hardware and software products is the creation of a strong "lock-in effect". Hardware designed specifically to interact with

other Apple products can offer a tailored effect that other companies struggle to match, and cross-platform services make it more convenient to own more than one Apple device.
A well-functioning lock-in effect, such as we see in Apple, increases the opportunity cost of switching to another ecosystem of products, increasing customers loyalty (or at least decreasing customers defection), and boost sales across the whole range of Apple products.

This process also creates significant barriers to market entry for possible competitors, which now have to convince the customers to switch to a different ecosystem in its entirety, instead of merely switching from product to product. Indeed, this vendor lock-in effect can be considered anti-competitive behavior and can be targeted by anti-trust authorities if a company is found to abuse this effect to create or maintain a monopoly in its industry.

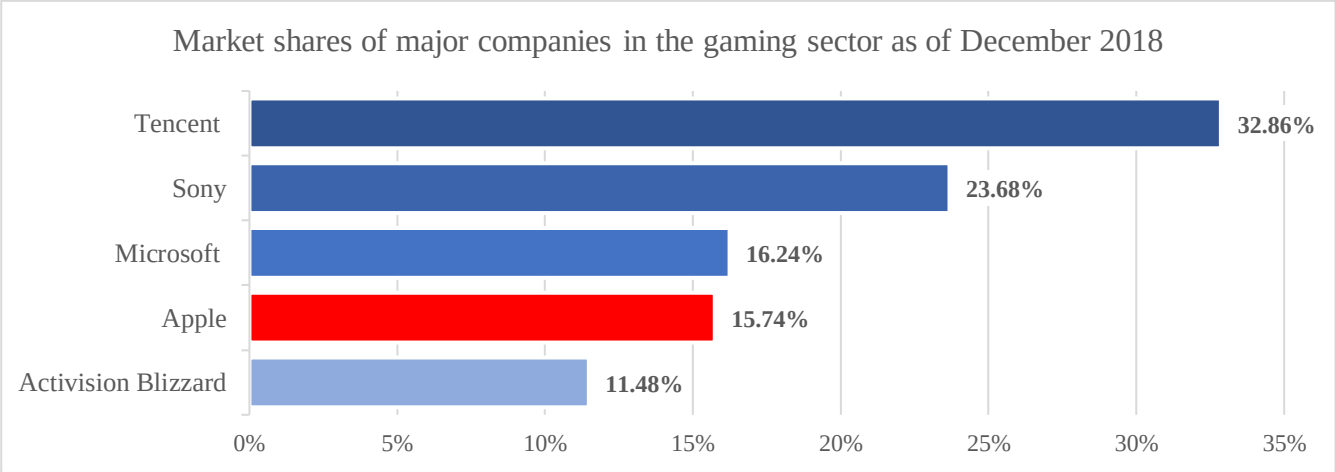
Apple will have a potentially unlimited space of maneuver in this new market. The advantage that sets the company apart from the rest of the competition is the control the company has on the entirety of its ecosystem: Apple can offer products in the areas of hardware, software, and services, covering the whole spectrum. It would be very difficult for another smartphone manufacturer to provide a similar package of offers – competition would probably come from other tech giants, such as Google or Amazon, more than from the aforementioned Chinese smartphone manufacturers.

Possible expansion routes

There are several possible expansion vectors that Apple could take (and is already taking) to offer new services to its customers and establish itself as a true services-focused firm (which also produces high-end hardware).

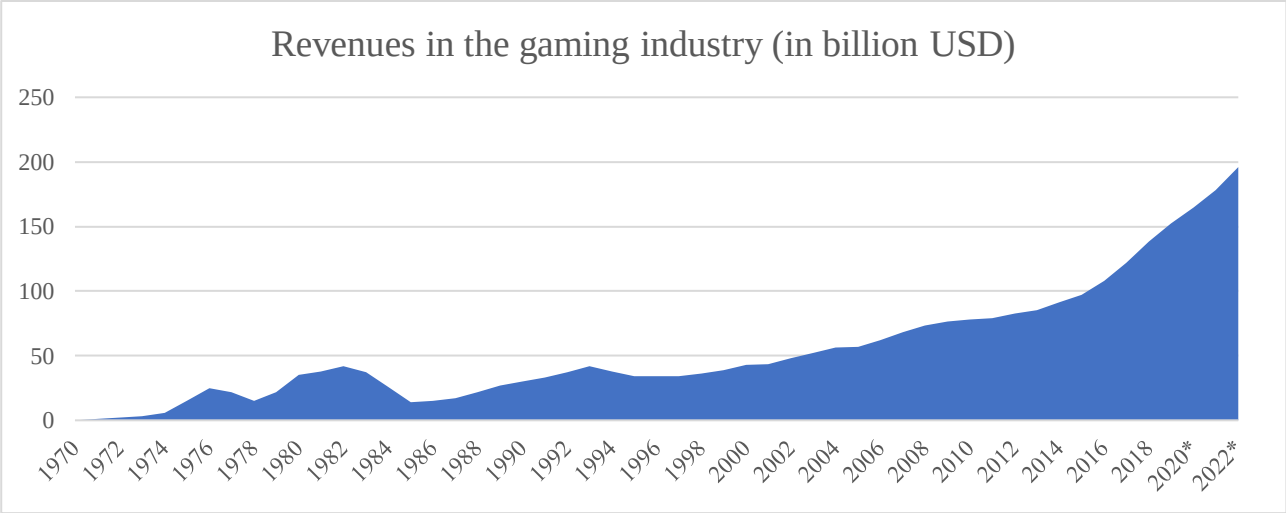
Apple as a player in the gaming industry

One of these routes is the entrance of Apple in the gaming industry, a field where Apple already has a strong foothold thanks to the success of the App Store, and where the company is looking to solidify its position with the launch of Apple Arcade.



17 Market share of major gaming companies, Gamingscan

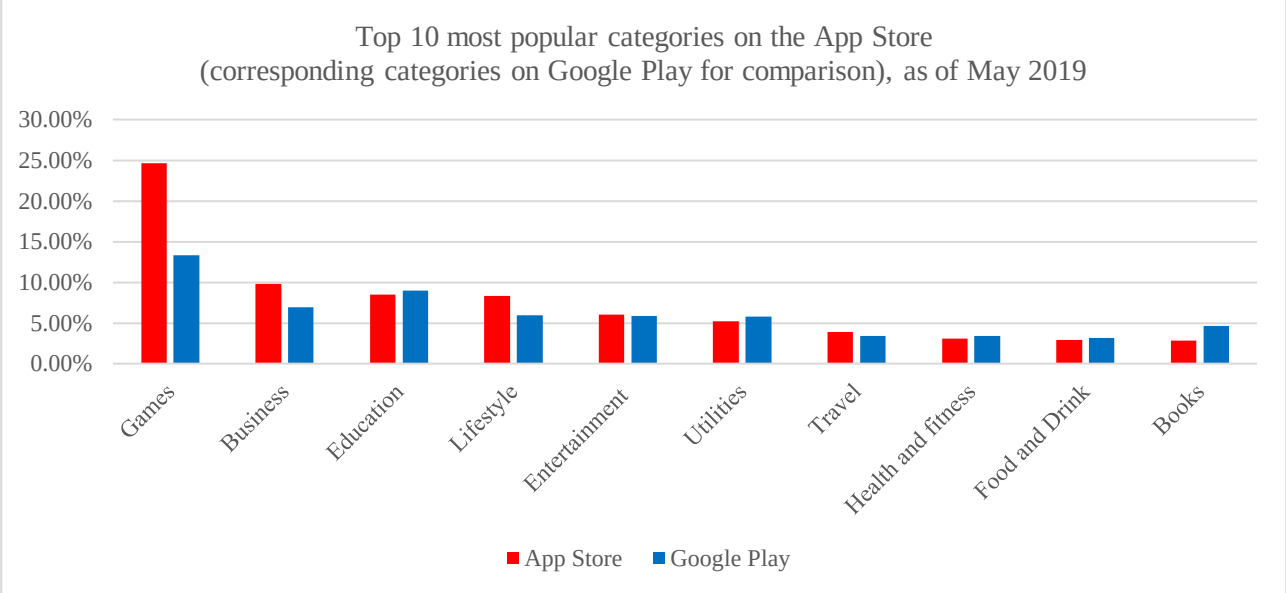
In this sector, mobile gaming is already the most profitable and fastest-growing slice, at almost double the value generated by PC games (respectively $68,5B and $35,7B)[10]. But the industry in its entirety has been very successful (and very profitable):



[10] https://www.gamingscan.com/gaming-statistics/

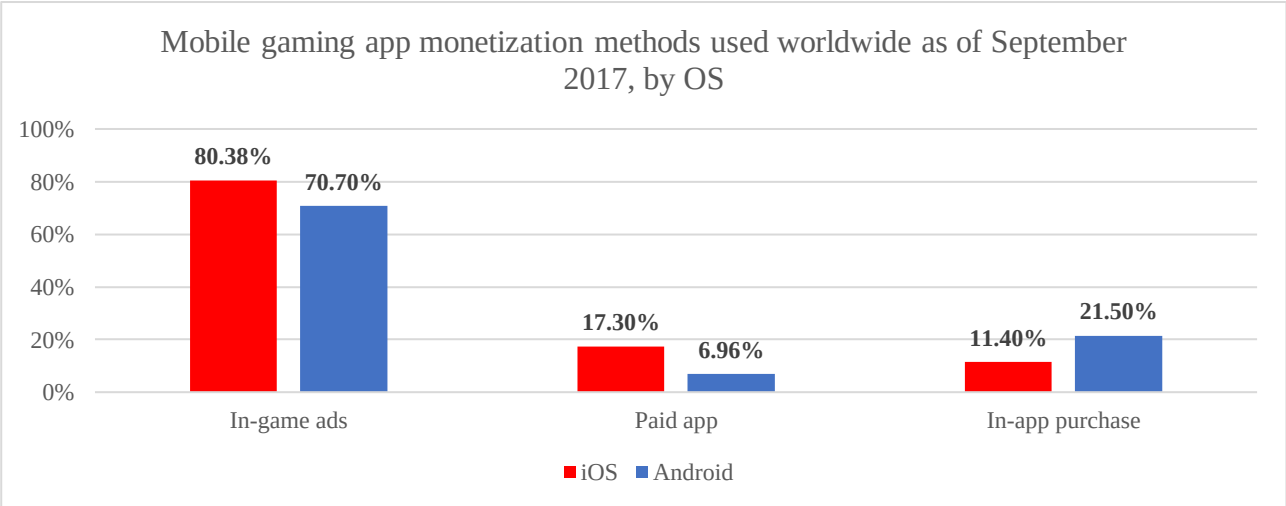
18 Gaming industry revenues, Gamingscan

Historically, mobile gaming on App Store has been far more profitable than on Google Play, even in absolute numbers, but the disparity in the number of active iOS and Android devices have endangered Apple's primacy. Mobile games developers have traditionally targeted iOS users, characterized by their higher-spending habits, and released their games on Android only in at a later time; but thanks to its much larger share of global users, Google Play will soon end up topping App Store in revenues and exclusive products. Maintaining the primacy in the mobile gaming industry is vital, as games are by the most popular apps on both OSes, but especially on App Store.



19 Most popular App categories, Statista

With Apple Arcade the main challenge will be to introduce a new business model to the mobile gaming market, where users are accustomed to a wide offer of free games. Despite being the most profitable share of the gaming industry, mobile gaming generates the majority of its profit thanks to the revenues of in-game advertisement; in-app purchases account for a minor share of the profits, and paid apps an even smaller one:



20 Apps monetization, Statista

It is however possible to see that App Store users are not only characterized by their higher spending habits, but also by their interest in paid apps, more than doubling the percentage of Android users in the same category. It would be more natural to adopt a subscription service such as Arcade for a customer base already more familiar with paying for its gaming apps. Apple Arcade is a bundle of games which can accessed by paying a monthly subscription fee, following the same "pay-to-play" model of premium apps. The percentages are reserved when in-app purchases are considered, with this "freemium" model being more prevalent on the Play Store. Freemium apps are "free-to-play", but monetize additional features, services, and goods available on the app.

Apple's entry in the streaming and content-provider industry

Another aspect of Apple's servitization strategy is the launch of Apple TV+. While the concept of an Apple media player isn't new (the first model of Apple TV was launched in 2007, and the unsuccessful Macintosh TV was first available in 1993), Apple TV+ marks the company's entry into the profitable market of streaming services.

In this sector, Apple can take the advantage of its already well-established ecosystem of products and strong brand awareness, by offering a free one-year subscription to its new service with the purchase of another Apple product (a move also employed by Amazon, which offers a free subscription to Amazon Video to all its Amazon Prime customers).

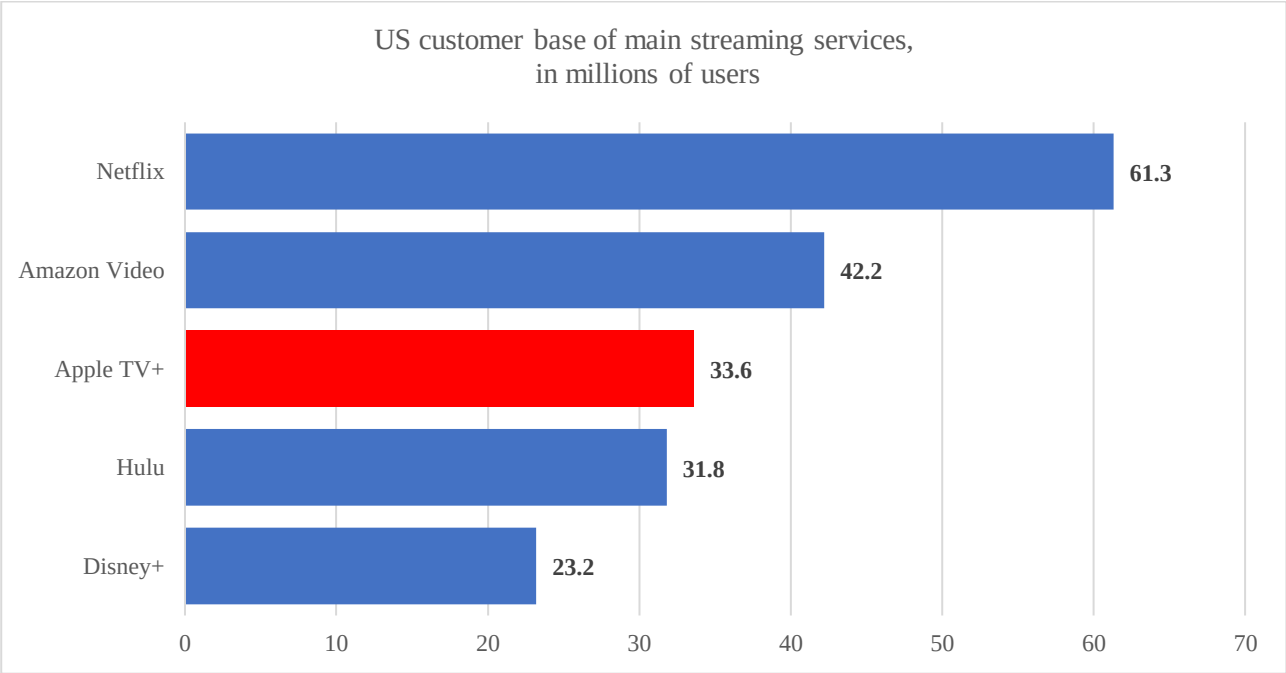
The advantage of Apple's network effect is considerable and sets the company aside from competitors such as Netflix and Disney. Even if a small fraction of its users were to become long-term enthusiasts of its streaming service, the effect would still be significant. According to the opinion of Kathy Huberty, Morgan Stanley's head of technology research:

> *"[…] we estimate Apple TV+ can become a $9B revenue business with 136M paid subscribers by FY25, assuming just 1 in every 10 Apple user pays for the Service by FY25"*[11]

[11] https://www.cnbc.com/2019/10/23/apple-tv-will-become-a-9-billion-business-by-2025.html

In fact, two months after launch, TV+ had already crossed the threshold of 33 million users (in the US alone) and had already affirmed itself as the third most popular service in the market, only topped by more well-established, incumbent competitors such as Netflix and Amazon Prime Video.

While the great majority of its subscribers were probably acquired thanks to its one-year free subscription promotion, such a strong start testifies the robustness and viability of Apple's approach to this new market:

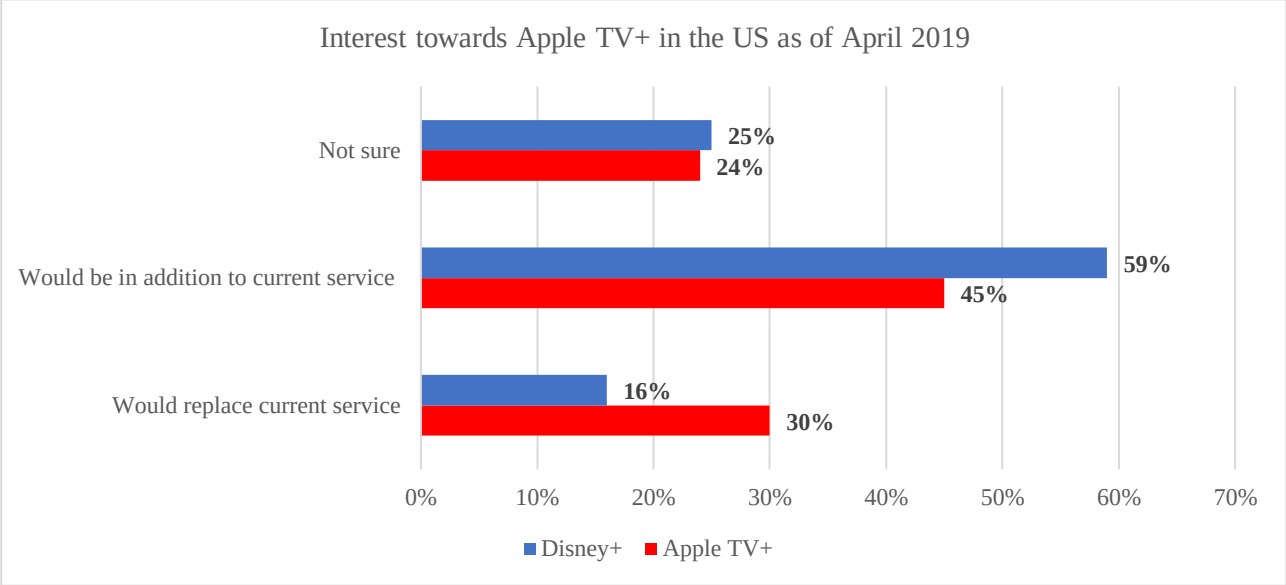


21 US customer base streaming services, Nasdaq

It would be misleading to directly compare these *promotional subscribers* to Netflix's or Amazon's *users*, but it is also important to remember that TV+ is one of the newest players on the market, and still lacks the extensive "word of mouth" network and library of original content its main competitors enjoy; in fact, its limited offer of content is probably one of the weakest points of TV+, at least for now.

It seems that Apple will focus mostly on original content, instead of presenting a library of movies and tv series produced by third parties. This gives the opportunity to better curate its offer, but also that, at least in its initial stages, TV+ will provide fewer options to its public compared to most of its competitors. This is by far the weakest point of this product, as streaming services are largely undifferentiated and are defined most of all by the quality or richness of the content they provide.

That said, even without the edge given by its network, TV+ is already an attractive product in the US market:



22 Share of adults interested In Apple TV+ and Disney+, Statista

Interestingly, and unusually (considering Apple's traditional position in the other markets it operates in), TV+ is so far positioned in the lower end of the market.

It is possible the cost of the subscription will increase in time as more content is made available, as it happened with Amazon Video and its relative Prime subscription. Currently, TV+ is the cheapest streaming service offered on the US market:

Netflix	Hulu	Amazon Prime Video	CBS All Access	Apple TV+	Disney+	HBO Max
$12,99	$5,99 (with ads) $11,99 (ad-free)	$8,99	$5,99 (with ads) $9,99 (ad-free)	$4,99	$6,99	$14,99

Apple One

According to insider rumors, and as reported by Bloomberg[12], Apple has been getting ready to launch of a series of bundles of its digital services, a concept similar to Amazon's Prime, which will allow its customers to access a number of the firm's digital offers at a lower monthly subscription fee. This new fruition method, dubbed "Apple One", will be made available together with the launch of the

[12] https://www.bloomberg.com/news/articles/2020-08-13/apple-readies-apple-one-subscription-bundles-to-boost-services

new iPhone 12 in October 2020. It is said that there will be differently tiered bundles, and it will include Apple Music, Apple TV+, Apple News+, and extra iCloud storage (obviously, at increasing price). Apple One will also include a new kind of service: subscription-based virtual fitness classes.

If true, this scenario would summarize several of the business strategies already examined, and would be the culmination of Apple's strategy to position itself as a dominant player in the services-based industry.
By utilizing the data gathered thanks to its presence in the hardware industry, Apple will be able to target different bundles based on what devices and services a customer already uses. It is difficult to overestimate the effectiveness of such a target and intimate marketing campaign.
This new service will also take advantage of Apple's "Family Sharing" system, meaning that the services offered by the bundles will be made available on multiple Apple devices inside the same family, as to increase their already significant network effect and as a mean of additional marketing.
If such endeavor proves to be a success, Apple could count on a stable long-term revenue stream to rival that of Amazon Prime, and create long lasting customer loyalty in its already dedicated userbase, creating a seamless connection between its hardware and services business, and improving the attractiveness of both.

Startups acquisitions

As a conclusion, an interesting insight on Apple's future technological strategy could be figured out by Apple's "startup shopping" in 2019 (the company acquires on average a new company every two-three weeks, but most of the deals are not made public). Apple acquired several startups last year, and the main ones (and those that we know of) are all mostly focused on providing new and improved services:

- Laserlike, machine learning
- Stamplay, API development and cloud services
- PullString, vocal computer conversation
- DataTiger, data-based marketing
- Platoon, music distribution
- Silk Labs, artificial intelligence
- Xnor.ai, artificial intelligence
- Dark Sky, weather forecasting
- Voysis, voice assistants and artificial intelligence

A smarter virtual assistant in the form of an overhauled Siri, and more powerful cloud-based services seem to be a general trend – innovations that will benefit the Apple ecosystem as a whole, instead of hardware improvements for just some of its devices.

Conclusions

To conclude, it is clear that the smartphone market is changing. In less than a decade, smartphones have gone from being futuristic object to commodities that we can take from granted.

Apple built much of its prosperity and reputation on the success of the iPhone, by far its most fortunate product. The invention of the modern smartphone forever changed the entire industry, and probably, by creating a new way for people to interact with society and other people, probably changed our modern history as well; social networks (with all their ramifications), to e-commerce, big data analysis, targeted advertisement and multitudes of other extremely significant dynamics would not have been possible on the scale we can report today without the widespread accessibility of portable advanced computing.

And yet, as technological development continues, one day the iPhone risks to be no longer a coveted product but "one of many", in an industry where the technological gap has been closed, all the breakthroughs exploited, and largely undifferentiated products compete for uncertain profit margins.

As always, when competing on prices becomes impossible, a company can opt for a diversification strategy. Since technological diversification is no longer sustainable in the long term, the entire industry will have to pivot and explore the synergies with a new market.

After all, this isn't exactly a new strategy for Apple, a company that in the past already shifted its focus from personal computers to mobile devices. By employing a services-dominated business strategy, Apple will be able to enter new markets while retaining the advantage of its network of users, offering an holistic bundle of goods where tailor-made hardware is developed as the basis for a rich ecosystem of different services. Once in place, such an ecosystem is essentially limitless in its scope, and will be largely determined by the company's ambition and creativity in finding new ways to engage its customers.

If there is a company ambitious enough to revolutionize on such a level its business strategy for the second time in less than two decades, that is Apple.

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