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Lenovo: Being on Top in a Declining Industry

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Abstract:

For the first time since the 2008 financial crisis, Lenovo, the world's largest PC maker, had not only failed to increase its revenues and profits but also a net loss. Lenovo's market share was still growing, but the PC market itself was shrinking by about five percent annually. Lenovo hoped to broaden its leadership toward smaller computing devices, a market that had seen more growth. It purchased Motorola Mobility in 2014 and continued to invest in its smartphone business through branding and innovation. Yet, in 2016, this business did not make a profit and only grew in some geographical markets. Lenovo faced fierce competition from giants such as Apple and Samsung and from Chinese manufacturers that had quickly grown in market share. How could Lenovo reignite growth and sustain its position as a global industry leader?

Keywords: Product Lifecycle, Strategy, Product Portfolio, Markets, Competition, PC, Smartphone.

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1 Introduction

Our overall results were not as strong as we wanted. The difficult market conditions impacted our financial performance.

—Yang Yuanqing, Chairman and CEO of Lenovo (Lenovo, 2016b, p. 9)

For the first time since the 2008 financial crisis, Lenovo, the world's largest personal computer (PC) maker, had not only failed to increase its revenues and profits but also a net loss. Lenovo's market share was still growing, but the PC market itself was shrinking by about five percent annually (see Appendix A).

Lenovo had hoped that its US\$2.91 billion acquisition of the Motorola Mobility handset business in 2014 would prove as fruitful as the company's acquisition of IBM's personal computing division a decade earlier. Such hopes proved to be too optimistic, however, because Lenovo faced strong competition in local and international markets. Its position among the smartphone vendors in China dropped from second to eleventh between 2014 and 2016, while its worldwide market share shrank from 13 percent to 4.6 percent. In 2016, its smartphones group had an operational loss of US\$469 million (Lenovo, 2016b).

In response, Lenovo embarked on a two-pronged strategy of consolidating its core PC business while broadening its product portfolio. The PC group, which focused on desktops, laptops, and tablets, aimed to improve its profitability through market consolidation and product innovation. The smartphones group focused on positioning the brand, improving margins, streamlining distribution channels, and expanding geographical reach.

However, the company was unsure about how it could thrive in a declining PC industry. Nor did it know how it would compete in a tough smartphones market dominated by the international juggernauts Apple and Samsung and strong local players such as Huawei, Oppo, Vivo, and Xiaomi.

Yang Yuanqing, Lenovo's chairman and CEO, wondered whether Lenovo's two-pronged strategy would reignite growth and sustain its position as a global technology leader.

2 Lenovo

Lenovo was a multibillion-dollar Fortune Global 500 company listed on the Hong Kong Stock Exchange. Its 60,000 employees worldwide supported operations in 60 countries and served its customers in over 160 countries (Lenovo, 2016b). It manufactured a variety of computers from smartphones to servers. It had US\$45 billion worth of sales in the company's 2016 fiscal year (see Appendix B for Lenovo's income statements and balance sheets)¹.

Three decades earlier, the company, then called Legend, had started in a small Beijing bungalow. Liu Chuanzhi, a computer scientist, and 10 engineers founded the company in 1984 and hoped to run the business by developing new technologies. They tried importing televisions and marketing a digital watch. But these attempts failed along with other early ones because many of the founders lacked business experience and concentrated only on product quality. As Chuanzi (Ling, 2006) said: "We were mainly scientists and didn't understand the market. We just learned by trial-and-error, which was very interesting—but also very dangerous."

2.1 Growth

The initial struggles helped the company learn about the latest computing technology from abroad and the consumer market in China (Marshall, 2001). The company experienced its first success in developing circuit boards to enable IBM PCs to process Chinese characters (Ling, 2006). The company started to grow: after a recruitment advertisement on the front page of the *China Youth News* in May 1988, it hired 58 people. In 1990, it began to manufacture and market computers under its own Chinese brand name. Only in 2004 did it adopt the name Lenovo (made up of *Le* from *Legend*, its previous English company name, and *novo*, Latin for *new*).

While the company broadened its product range to workstations, servers, digital entertainment devices, and mobile phones, its PC business remained its core focus. It grew rapidly thanks to a quickly expanding Chinese PC market. Its share in this market mushroomed from 14 percent in 1998 to 30 percent in 2000

¹ Lenovo's fiscal years end on 31 March.

(Marshall, 2001). It raised US\$212 million from its second public offering in 2000 to fund its continued growth. Lenovo also saw an opportunity to grow internationally and, in 2005, bought IBM's PC division for US\$1.25 billion. Afterwards, the company's turnover almost quadrupled in size (Lenovo, 2006).

In many ways, this merger came to define Lenovo's new identity as a global company. It embraced the diversity of Eastern and Western cultures to become one of world's largest technology firms. It focused on developing new products while growing both organically and through mergers and acquisitions.

In the decade after acquiring IBM's PC division, Lenovo realized steady growth in revenues except for one year during the 2007-2008 financial crisis². An increase in PC sales and the company's acquisition of new businesses primarily drove the company's growth. In 2011, it bought NEC, Japan's largest PC vendor at the time, and Medion, a large German consumer electronics company. Two years later, it acquired CCE, a large Brazilian consumer electronics company³. These acquisitions helped Lenovo to become a dominant player in the PC market worldwide. By 2016, the company had reached record shares of the PC market in all geographical areas: 36.5 percent in Greater China, 17.5 percent in the Asia-Pacific (excluding Greater China), 13.7 percent in the Americas, and 20.0 percent in Europe, the Middle East, and Africa (Lenovo, 2016b). See Appendix C for a geographical analysis of Lenovo's turnover.

Lenovo's growth in PCs was unlike its experience in phones. In 2006, its Mobile Handset product group accounted for four percent of revenue. Its growth in China was strong initially but weakened later as new competitors entered the market. Lenovo sold the business in March, 2008, "to allow the group to better focus on its core PC business" (Lenovo, 2008). Not long after, however, Lenovo pivoted when it launched its mobile Internet strategy. It hoped to benefit from the new and fast-growing product category by buying back its Mobile Business Group in 2009 (Shah, 2010). The new business group started growing steadily, especially in China. The company hoped to expand its share of the market in the Americas by acquiring Motorola from Google in 2014. As Yang Yuanqing, Chairman and CEO of Lenovo said (Ling, 2006):

[In fiscal 2015], we shipped a record 76 million units and strengthened our position as the world's #3 smartphone company. The addition of Motorola helped us expand to more than 60 markets worldwide, making us a truly global smartphone company. And now, almost 60% of smartphone volume comes from outside of China, giving us a global footprint that is a true competitive advantage.

Lenovo also invested in computing storage and cloud services. In 2012, it launched a joint venture with EMC to take over a computing storage enterprise that EMC had purchased earlier. In the same year, it also acquired Stoneware, a provider of cloud-computing services. Two years later, it bought IBM's x86 server business. It acquired these companies to serve its objective of providing consumers and organizations with computing solutions that included both traditional hardware and Internet-based services (Lenovo, 2012). After Lenovo's reorganization around 2015, it set up its Enterprise Business Group and the Ecosystem and Cloud Services Business Group (ECS). While ECS remained tiny (it represented less than two percent of Lenovo's revenue in 2016), its Enterprise Business Group grew from one percent of the company's revenues in 2014 to 10 percent in 2016.

2.2 Running Lenovo

Lenovo ran its business from several locations. It was incorporated and headquartered in Hong Kong; its key operational centers were located in Beijing, Morrisville in North Carolina, and Singapore. Seven of its nine research centers were in China, one was in Japan, and one was in the US, while its sales centers were in the US, France, China, and Singapore. With these centers around the world, Lenovo tried to be both global and local at the same time so it could embrace differences across markets to capitalize quickly on new ideas and opportunities in different locations.

Its top management team comprised six corporate executives (CxOs) who had mostly begun working at the company in the last five years. Others on the team were all executive vice presidents or senior vice presidents and led various groups or divisions (see Appendix D). Representing radically different cultures and countries, the top management team emphasized the value of diversity and saw it as a strength. The company strove to serve different customers with widely diverse needs and desires with a team of "wide-ranging experiences, multiple skills, and a variety of cultural backgrounds" (Lenovo, 2016a). It hired people from all walks of life but with the common aspiration of achieving excellence in delivering

² The financial crisis peaked in 2008, causing Lenovo to report a decline in profits for fiscal year 2009.

³ Lenovo sold CCE back to its original owners a few years later.

unparalleled products. To this end, the management emphasized teamwork, entrepreneurship, and innovation and focused on transforming Lenovo from a device-oriented company to a more customer-centric company. Yang said (Lenovo, 2016b, p. 11): “We want to make life better and work more efficiently by delivering smart end-user devices, powerful infrastructure, all with connected services and apps, and the best user experience.”

Yang observed that, in the age of the Internet of things, a wide variety of devices could embed computing. With the advent of smartphones, tablets, smartwatches, and other mobile computers, the number of connected computers people used had begun to increase. Serving those needs required centralizing the user, not the device. Yang said (Lenovo, 2016b, p. 11):

While new ideas for devices will emerge, the device itself will no longer be enough. Customers will need a device that is seamlessly connected to the cloud in order to deliver the right solution or experience—at home, at work or on the go.

With this more holistic perspective on the use of connected devices and services, Lenovo saw growth opportunities. It had already begun expanding its capabilities in serving customers with the cloud, and it had set up its ECS. With these initiatives, Lenovo wanted to make devices that were more seamlessly connected because it saw devices no longer as end products but as entry points for experiencing content and services. According to Yang (Lenovo, 2016b, p. 42):

To maximize performance, we will manage different types of businesses differently based on the varying stages of maturity as well as synergy with our core business. Based on these criteria, each business will have the appropriate set of performance metrics, priorities, management processes, ownership structure and incentives.

Lenovo had aligned its organizational structure to support different categories of businesses.

- The PC and Smart Device Business Group focused on desktop and laptop PCs, tablets, detachables, and gaming devices. It accounted for most of the revenue (see Figure 1).

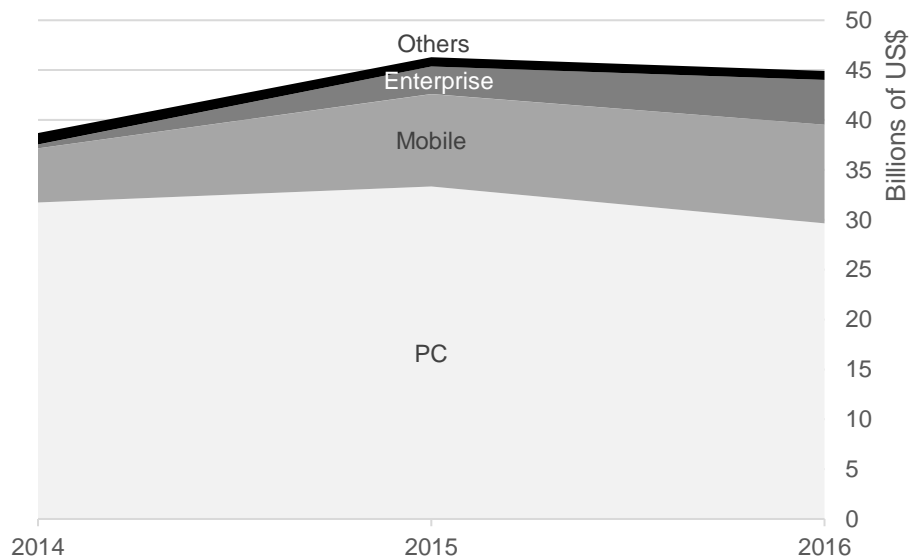


Figure 1. Analysis of Lenovo's Revenue by Group and Fiscal Year in Billions of US Dollars (Adapted from Lenovo, 2014; Lenovo, 2015; Lenovo, 2016b)

- The Mobile Business Group focused on smartphones; one subgroup concentrated on China where it had accumulated much experience, and another focused on the rest of the world where it saw much potential to grow.
- The Data Center Group, previously called Enterprise, accounted for 10 percent of Lenovo's revenues in 2016, but the company saw it as key to delivering a valuable product portfolio for enterprise customers (Lenovo, 2016b).
- The Lenovo Capital and Incubator Group did not focus on particular product categories but sought to drive innovation. It invested in startups, explored new technologies, and focused on maximizing valuation and return on investment.

In sum, the PC and mobile business groups were Lenovo's dominant groups. While it had a common philosophy for its products, it also recognized the importance of cultural specificities. Lenovo had specified different strategies across products and, depending on geography, even in product groups.

3 Personal Computers

In 2016, Lenovo seemed to do relatively well in the extended PC market. It was the world's largest vendor of traditional PCs for the third straight year and one of the largest vendors of tablets. Yang said (Lenovo, 2016b, p. 8):

We achieved a record market share of 21% as we continued to win and deliver strong profitability in our core PC business. [We also achieved a] record market share in our tablet business: We sold almost 11 million units and outgrew the market for the year, strengthening our #3 position in the world.

While outgrowing the market was a source of pride, the growth of the market itself caused concern. For several years, the total number of PCs sold worldwide had been declining. This decline came amid changing conditions in the industry.

For instance, diversified form factors changed the marketplace. Desktop computers had long been the dominant form of computers, until laptop sales overtook desktop sales in 2008 (Hartley, 2008). In 2010, Apple introduced the first successful tablet computer—the iPad—which attracted much attention. Tablets filled a gap between smartphones and laptops in terms of portability, screen size, and computing power and fitted into many everyday situations. The rapid adoption of tablets caused their sales to overtake that of laptops in 2011 (ABI Research, 2011). As tablets rose in popularity, vendors hoped to fill more gaps on the same continuum. Some introduced “phablets”, situated between smartphones and tablets⁴, and “convertibles”, situated between tablets and laptops. Convertibles, also known as two-in-one devices, allowed people to use a physical keyboard as if using a laptop and to use the touchscreen display as if using a tablet.

In the marketplace, this diversification caused quite a stir. Many tablet vendors came and went after Apple introduced its first iPad (Statista, 2016b). In 2011, Apple alone owned 60 percent of the tablet market, but quickly lost ground to a flurry of new entrants. By 2016, as sales dropped and the market seemed to settle, more than half of Apple's 2011 share ended up with Samsung, Amazon, Lenovo, and Huawei.

For consumers, the new form factors allowed them to conveniently handle devices without a table or desk. Their overlap in computing functionality made them partly substitutes and partly complements. The sharp rise of tablets in the US, for example, came with only a slight decline in ownership of desktops or laptops (see Figure 2). In comparison to tablets, convertibles resembled laptops more closely and were more likely used as a replacement for them.

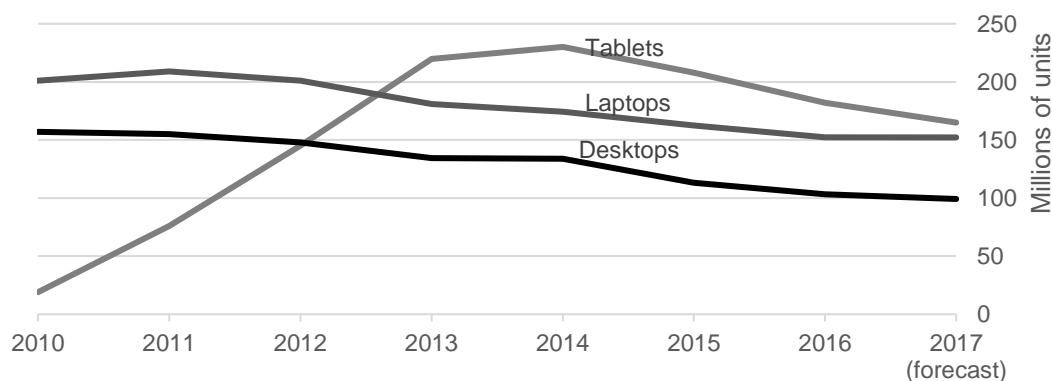


Figure 2. Worldwide Sales of PCs by Type and Year in Millions of Units (Pew Research Center, 2015)

Relying less on a single computer, people waited longer to upgrade their PC. It also became easier to run contemporary operating systems on older machines. The average upgrade cycle slowed from about four

⁴ Lenovo's PC group did not produce phablets, smartphones, and smartwatches.

years to five or six years in 2016 (Shah, 2016). Holding onto their desktops and laptops and acquiring new forms of computers, households owned an increasing number of Internet-connected devices (TakCarta, 2016). The average household in the UK, for example, owned seven such devices (Associated Press, 2015).

The average selling prices across all PC makers tended to decrease slowly over time (Arthur, 2014). The average profit per PC of the largest PC vendors hovered around a mere US\$15, with the average profit margin often between two and three percent (Arthur, 2014). These cutthroat conditions exerted much pressure on all vendors, especially those without economies of scale.

With high price pressures and weak demand, the market continued to consolidate. The combined market share of the three largest manufacturers—Lenovo, Hewlett-Packard (HP), and Dell—had grown from 41 percent in 2011 to 57 percent in 2016. While Apple, Acer, and Asus saw little change in their traditional PC market share, the smaller manufacturers saw their combined share halved from 42 percent in 2011 to 21 percent in 2016 (see Figure 3) (Gartner, 2016a)⁵.

Realizing higher volumes in traditional PCs was not going to get any easier in the future. IDC, a research firm, forecasted a one percent compounded annual decline in its predictions up to 2020 (IDC, 2016a). It predicted that desktops sales would decline by 5.9 percent annually in mature markets and by 0.7 percent in emerging markets and that laptop sales would decline in mature markets by one percent and grow in emerging markets by two percent. See Appendix A for more details on this forecast.

For Lenovo, product innovation seemed to be more of a necessity than a driver of growth. At annual consumer shows worldwide, vendors highlighted products with better specifications than the year before. They also exhibited curved displays, larger touchscreens, bendable devices, augmented and virtual reality, virtual keyboards, and so on. The rate of innovation in the industry set market expectations and made it hard for vendors to stand out. Yang pointed out (WARC, 2012):

Selling PCs is like selling fresh fruit. The speed of innovation is very fast, so you must know how to keep up with the pace, control inventory, to match supply with demand and handle very fast turnover.

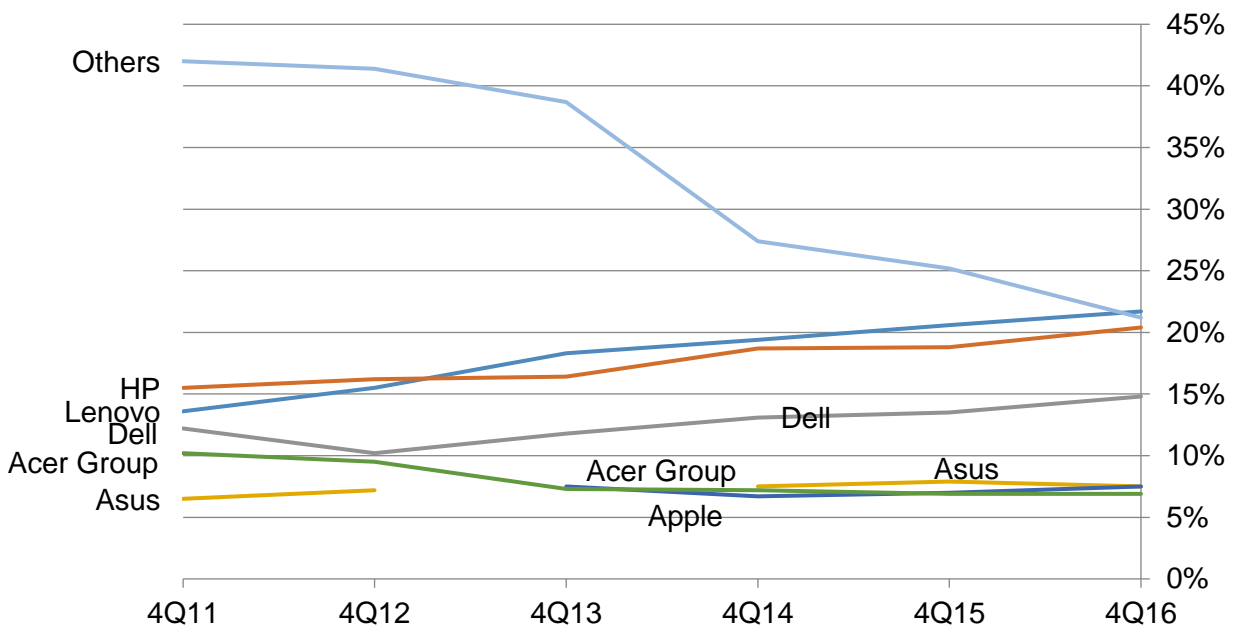


Figure 3. Vendors' Shares of Worldwide Sales of PC Units (Excl. Tablets) in the Fourth Quarters of 2011 to 2016 ("Market Share", 2017)⁶

Vendors tried improving their profitability by offering extras. Accessories, software, maintenance services, warranties, and cloud services often enjoyed a much higher profit margin. Cloud services were an

⁵ Data includes desk-based PCs, notebook PCs, and ultra-mobile premiums (such as Microsoft Surface) but not Chromebooks or iPads.

⁶ Data on Asus in 2013 and on Apple in 2011 and 2012 were missing.

increasingly popular way to serve consumers and enterprise customers with continued and integrated computing services (Arthur, 2014).

3.1 Competitors

HP, Lenovo's chief competitor in traditional PCs, had experienced similar growth in the market. A much older organization, HP was a global leader in PCs, printing, and imaging, but most of its revenue came from PCs. In late 2015, HP spun off its large Enterprise division, which employed 250,000 employees (The Economist, 2015). Meanwhile, it increasingly outsourced the assembly of its products to contract manufacturers worldwide (Chao, 2012). While HP's average PC sale price was declining, it seemed to benefit from sales of higher-end laptops and convertibles, which helped it improve its operating margin to about 4.2 percent in 2016. See Appendix E for financial information about Lenovo's main competitors.

Dell—a computer hardware company that began in 1984 and became private in 2013—was the world's third largest vendor of traditional PCs in 2016. Its approach to PC sales emphasized customizability: it manufactured or configured PCs for users according to their specification. Dell's product range included tablets, convertibles, laptops, desktops, monitors, gaming devices, servers, networking equipment, and printers. Like Lenovo, it had seen opportunity for growth outside the core of traditional PCs and invested much in storage. Three years after Lenovo partnered with EMC to split off and run a part of EMC, Dell bought EMC in 2015 for US\$67 billion, which made it the largest-ever acquisition in the technology sector at the time.

Apple, Acer, and Asus had PC sales that ranked just below those of Lenovo, HP, and Dell. Apple, one of the world's most valuable brands, had always offered desktops that integrated its applications, its operating systems, computing hardware, and a display in a single device. More broadly, it had been at the frontier of serving customers through the seamless integration of hardware, software, and cloud services in and across its devices. It sold smartphones, tablets, laptops, desktops, and TV set-top boxes. As a PC vendor, Apple stood out from the rest with a higher average sales price (Arthur, 2014).

Acer aimed to offer extras through the cloud and the Internet of things. In 2015 and 2016, it acquired a GPS cycling computer company, a robotics startup, a virtual reality hardware company, and a maker of pet cameras. Asus had a similar orientation to Acer: it offered a broad range of computing products, including smartphones, and sought to expand this range. It also focused on various aspects of innovation, such as portability, power efficiency, and sustainability (ASUS, 2015).

4 Smartphones

In 2016, Lenovo was responsible for about 4.6 percent of global sales. Its smartphone sales had fluctuated, and in 2016, both its smartphone sales and its smartphone market share were declining, which Lenovo wanted to change.

The smartphone market was vibrant and its growth trajectory steep (see Figure 4). The sales of smartphones to end users doubled every two years from 172 million units in 2009 to 1,423 million units in 2015 (Statista, 2016c). Smartphone sales surpassed PCs sales in late 2010 and outsold them four to one in 2015 (Albenesius, 2011). This growth caught the attention of many technology companies and fueled much investment. Patent wars broke out, and companies forged billion-dollar partnerships.

As mobile phones originally came with little functionality beyond mobile voice and text telecommunication, the makers of the devices developed strong ties and sometimes even exclusive partnerships with telecom service providers, which shaped the game at the dawn of the smartphone. Many vendors sold their smartphones to end consumers via operators, also called carriers, which tied them to service subscriptions. A common sales model was a two-year contract with payments due each month, which lowered the barrier to upgrade the phone and renew the contract after. Financially, this model allowed more consumers to adopt and to continue to adopt the newest high-end phones. It also meant that makers of smartphones, compared to PC makers, had less control over the consumer-oriented activities in distribution, marketing, sales, and customer relationships.

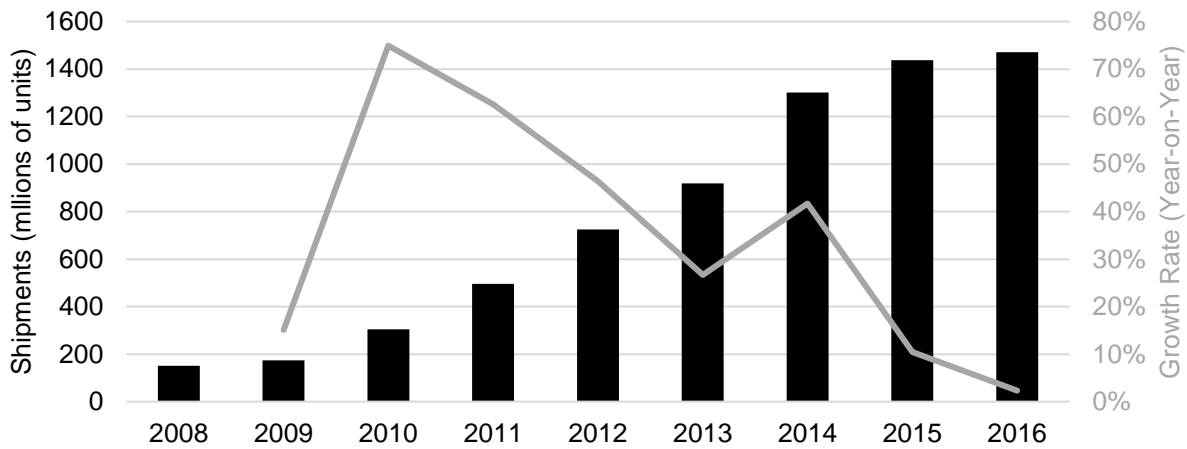


Figure 4. Worldwide Shipments of Smartphones in Units and Year-on-year Growth (Statista, 2016c)

After years of double-digit growth, in 2016, the smartphone market began to cool: worldwide, smartphone shipments increased by two percent, but they declined in some geographic markets. Countries varied in their telecom infrastructure, local service providers, and competitors. Adoption rates varied widely, too, and correlated strongly with GDP, which Figure 5 shows (Poushter, 2016). Yang said (Lenovo, 2016b, p. 30):

The rules of game are so different across different regions. So we split the Mobile Business Group (MBG) into China and “Rest Of World” (ROW). MBG ROW is ready for profitable growth, while China is at a critical point of rebuilding its competitiveness.



Note: Percentages based on total sample.

Figure 5. Portion of Adults Who Report Owning a Smartphone in 2015 in Percent by Country (Poushter, 2016)

4.1 China

In 2009, Lenovo decided to launch its smartphone business with increased investment in China. It bought back its mobile phone division for US\$200 million, and, by 2011, it had developed its own manufacturing facility in the Chinese province of Wuhan with the capacity to make 40 million smartphones annually. The company aimed to serve Chinese consumers across economic segments by offering products in a wide range of prices and by partnering with operators to offer subsidies and make phones more affordable.

Initially, its plan bore fruit; by the end of 2012, it had captured 14 percent of the market, second only to Samsung. In the following years, however, operators in China slashed the smartphone subsidies that Lenovo relied on (Bloomberg, 2014). New entrants such as Xiaomi, Oppo, and Vivo introduced low-cost smartphones, while Huawei introduced high-end phones. Chinese consumers began to feel more comfortable buying smartphones online and without operators as intermediaries. Lenovo was poorly prepared for these trends. Having invested much in the channel that combined operators and retail stores, it lost most of its share in China to Apple and new Chinese competitors. Yang said (Lenovo, 2016b, p. 21):

The competition in [the] China smartphone market remained very keen while demand turned softer due to the economy. The Group has taken actions to strengthen its open channel partnership and brand strategy and to shift its product portfolio towards higher average selling price in order to turn around its China business over time.

In 2015, Lenovo launched a subsidiary, Zuk, and set up a separate smartphone business group specifically for China. With this reorganization, it aimed to address the economic segments through multiple brands: Moto, Lenovo, and Zuk. Moto was a brand of Motorola and associated with high-end phones. The Zuk brand was more affordable with prices under US\$250. This multibrand approach had not led to growth in fiscal 2016 because Lenovo faced tough competitors across all price levels. See Appendix F for the Chinese market shares of the largest smartphone competitors.

Oppo and Vivo, both owned by BBK Electronics Corporation, a Chinese consumer electronics company, had quickly gained market share in China to achieve ranks one and three in 2016 with 17 and 15 percent, respectively (IDC, 2016b). They quickly developed smartphones, adopted the latest technology and aggressive ad campaigns, and sold them at low prices. They wanted to grow internationally using their facilities in India and Southeast Asia.

Huawei, the world's largest telecom equipment manufacturer, had established itself as one of the leading smartphone makers in China for many years. In 2015 and 2016, it sold about 18 million smartphones every quarter, which made it number one in 2015 and number two in 2016. While it had relied heavily on relatively cheap handsets in the past, it increasingly focused on mid- to high-priced smartphones, which accounted for about 60 percent of its sales in the third quarter of 2016. One Huawei brand, Honor, targeted inexpensive, online-only sales, whereas the Huawei brand itself focused on higher-priced phones.

Newcomer Xiaomi stunned its smartphone competitors. In just four years, it gained a 15 percent share in a quickly growing market. Its business model stood out: offering smartphones directly to consumers without operators or retail shops at a very low price point. However, the surge in e-commerce did not last as long as Xiaomi had hoped, and the company found it had to push its phones into retail stores in 2016. Mediocre product reviews also hurt. In 2016, Xiaomi's market share halved, and its shipments dropped by 40 percent (IDC, 2016b).

Apple was also losing ground but not as quickly. It was the only foreign smartphone maker that had survived in the top five. Initially, it had benefited from high margins and its perception as an excellent brand with outstanding products. However, the rise of new Chinese brands and a lack of major innovations to its iPhone had some Chinese consumers questioning its value for the money. Per phone sold, Apple stood out from the rest with much higher prices.

This intense competition was not Lenovo's only concern. More than half of all Chinese already owned a smartphone, a number that rose by the day. In the higher-end segment, this fact made China a mature market driven more by replacement than initial adoption.

4.2 Outside of China

Lenovo's difficulties in China led the company to shift its ambitions to markets elsewhere. While it had not established leadership in any geographical location, it had grown in emerging markets. It focused on continuing its growth in these markets while breaking through mature markets.

In emerging markets, Lenovo's sales had increased thanks to rising demand from first-time buyers. Growth was particularly rapid in India, Indonesia, Russia, and across the Middle East, which allowed Lenovo to report record-high shipment growth in three geographies in 2016. In the Asia-Pacific (excluding China), it realized 96 percent year-on-year growth; in Europe, the Middle East, and Africa, it realized 83 percent growth; and, in Latin America, it realized 46 percent growth (Lenovo, 2016b). In countries with low adoption but relatively high GDP growth prospects, it forecasted strong continued growth in smartphone demand. In combination with a large population, these characteristics made India in particular an appealing market for Lenovo and its competitors.

However, mature markets caused the company some concern. Lenovo's product transition in North America was taking longer than expected, which resulted in a 13 percent decline in the company's global shipments in fiscal 2016. Consumers and businesses were not choosing Lenovo to replace their smartphones but rather Samsung, Apple, or Huawei.

Samsung had been the market leader since the downfall of BlackBerry and Nokia. As the world's largest consumer electronics company, Samsung used its size to its advantage. It used its technical and financial capabilities to quickly try out many models to see what the market liked (Grobart, 2013). Its organization was militaristic with clockwork planning and a culture of falling in line. Its profit margin in smartphones was lower than that of Apple but higher than that of many newcomers. Samsung increasingly saw new Chinese manufacturers as a threat given that they caused the company's global smartphone share to drop from 30 percent in 2012 to about 20 percent in 2016.

Apple was number two in terms of smartphone shipments and number one in profit. Having a holistic vision of user experience, it integrated its hardware with a proprietary operating system to focus its attention on just a few smartphone models. This platform strategy allowed Apple to create a more transformative user experience that led to enhanced brand loyalty and higher margins, which, at times, exceeded 100 percent of the total market's profits (Reisinger, 2016)⁷.

Huawei, with its telecom equipment already present in many organizations and households around the world, started to aggressively establish itself in the smartphone market. It increased its global market share from 3.3 percent in 2012 to 10.6 percent in 2016 and, thus, positioned itself as a major contender to Samsung and Apple. Its success in telecom provided ample resources for research and development. It also leveraged intangible assets, such as relationships with operators in Europe, Africa, and Latin America, to strike deals and cross-sell smartphones with switches and other network equipment.

4.3 Smartphone Innovation by Lenovo

Since 2014, Lenovo made some bold moves by buying Google's Motorola Mobility and liaising with Google to equip smartphones with augmented reality. Yet, it faced a daunting task in taking on Samsung, Apple, and Huawei.

Motorola had had an 85-year history in the US and possessed two valuable brands that Americans knew well: Motorola itself and Moto. Its relationships with US operators allowed it to continue an ongoing deal with Verizon and to place the Moto X phone on three of the four national operators. Lenovo saw a good match of these assets with its growth ambitions and bought Motorola Mobility from Google for nearly US\$3 billion. It hailed the acquisition as a step up to the third position on the global stage.

However, it only marginally and momentarily realized this promise. In the first quarter of 2015, Lenovo reached the third position with 5.6 percent—just above Huawei with 5.2 percent and well under Samsung with 24.6 percent and Apple, with 18.3 percent (Statista, 2016a). By the second quarter that year, Huawei had overtaken Lenovo.

Lenovo changed its plans for Motorola shortly after its acquisition. It had intended merely to nurture Motorola as an independent subsidiary but then decided to eliminate the Motorola brand and many inherited jobs (Whitwam, 2016). It revamped its high-end product line with Moto Z phones that featured a

⁷ Since the total market's profits include losses of competitors (i.e. negative profit), Apple's share could exceed 100 percent.

modular design. Users could clip separate modules, called Moto Mods, onto the back of the phone to equip it with a better camera, better speakers, a second battery or a projector.

While imaginative, this modular approach proved tricky. Product reviews complained about the high price tags of the modules (Savov, 2016b). Google also abandoned a project to make a modular smartphone (Statt, 2016). Rafa Camargo, Lead Engineer of this Google project said (Hollister, 2016):

When we did our user studies, what we found was that most users don't care about modularizing the core functions. They expect them all to be there, to always work, and to be consistent.

Lenovo launched the Moto brand, including its Moto Z, in most of its markets worldwide. In India and Brazil, it did well, but, by 2016, Motorola had not yielded the overall results Lenovo had hoped for (Savov, 2016a). Yang suggested that internal issues constituted one reason for these lackluster results: "Integration efforts did not meet expectations". Further, he said that Lenovo continued its endeavor to align Motorola Mobility with Lenovo "to leverage the[ir] complementary strengths, streamline the product portfolio, improve efficiency and enhance the cost structure" (Lenovo, 2016b, p. 19).

Another key innovation was Lenovo's Phab smartphones. They were the first consumer smartphones that enabled applications to provide augmented reality using Google's Tango platform. Phab users could measure the physical space around them and augment this space with, for example, virtual desks, dogs or dominos. Users could put any digital object in a 3D model of their environment and see the object in the live camera view as if it were physical. While the Phab smartphones were relatively large and thick and their augmented reality performance was irregular at times, many reviewers saw them as first steps in providing a new way to play, learn, and discover (Velazco, 2016). Competitors of Lenovo followed suit, and Asus announced it would launch a Tango phone in 2017 (ASUS, 2016).

5 Cross-product Synergies

While the smartphone market clearly differed from the PC market, coordinating the two businesses could help organizations such as Lenovo achieve synergies.

Like PCs, smartphones comprised a central processing unit, a graphical processing unit, memory components, a motherboard, an electric power unit, a screen, speakers, and various components to allow for wired and wireless connections with other devices. While some devices differed in size, most types of components relied on the same or similar materials and manufacturing processes. Producing PCs and smartphones together, as Lenovo did in its facility in Wuhan in China, offered several advantages. The innovation of PCs and smartphones could rely on the same R&D resources. Deals with vendors of raw materials, components, and machines could become more attractive, while the flexible planning of production capacities could enable more manufacturing efficiency and, thus, lower costs and time to market.

Huawei had achieved cross-product synergy by bundling smartphones and network equipment to telecom operators. Lenovo might benefit in similar ways. Some of its PC distribution channels, such as retail stores in consumer electronics, were clearly suitable for the smartphone business, too. As smartphone purchases were increasingly detached from operator subscriptions in some countries, cross-sales would become attractive, which would apply to not only retail stores but also online resellers. Cross-selling PCs and smartphones to corporate customers could also become more lucrative (Gartner, 2016c).

Another area of potential synergy was in offering benefits to the users of multiple devices. Apple had made the most progress in developing an ecosystem that improved cross-product usability. It allowed users to transfer or stream media and other files across devices and to and from the cloud. It did not offer separate products but rather a range of compatible products and services. Even though Lenovo did not have such ecosystem, Yang saw possibilities (Lenovo, 2016b, p. 11):

Delivering on this promise—innovative devices + cloud connectivity—is where Lenovo will attack and grow. This is where we have proven capabilities, core competencies and competitive advantages.

Potentially, by offering cloud services and connecting these services with devices, Lenovo could make all these devices more attractive. But, as Lenovo had long been growing as a device-oriented company with dedicated business groups targeting specific products, achieving a seamless integration with its cloud services across its devices could prove a formidable task.

6 Looking Forward

Lenovo seemed financially able to continue to invest in its smartphone operations. While the PC market was shrinking, Lenovo had been able to increase its share in it. As consolidation showed no signs of ending, Lenovo could likely continue to profit from PCs in the foreseeable future. Nonetheless, the company had to grapple with strong competitors that had ample resources, integrated product portfolios, and established relations with telecom operators. At the same time, it had to compete with smaller players that were adept at penetrating the lower-end markets.

In the rapidly changing smartphone market, Lenovo felt it was between a rock and a hard place. Yang wondered how Lenovo could deploy its vast resources most effectively.

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Appendix A: Worldwide Shipments of Personal Computers

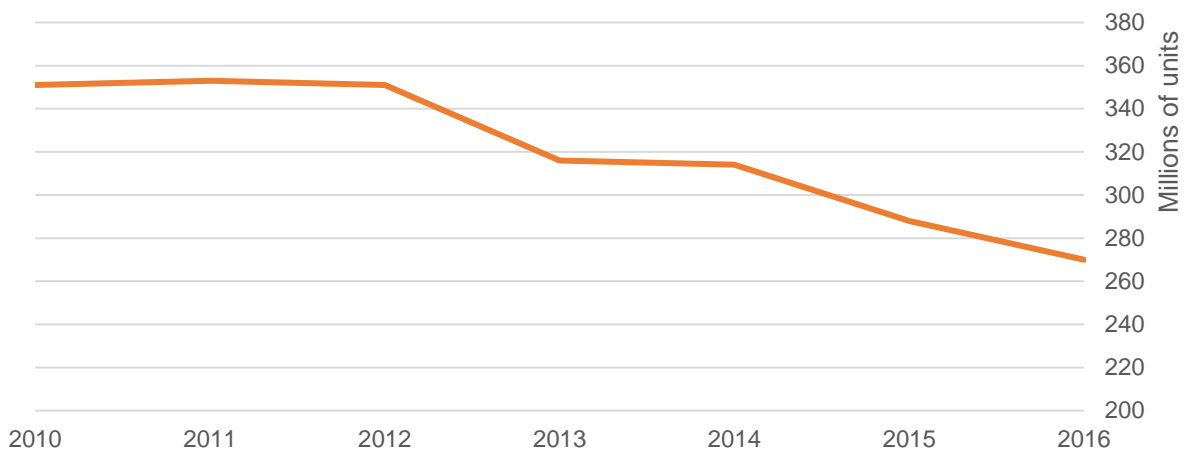


Figure A1. Number of Personal Computers Recently Shipped Worldwide (Adapted from Gartner, 2011; Gartner, 2012; Gartner, 2013; Gartner, 2014; Gartner, 2015; Gartner, 2016b; Gartner, 2017)

Table A1. Market Outlook of PCs by Type and Market (IDC, 2016)

Product category	Region	2016		2020 (forecast)		Five-year CAGR*
		Shipments (millions)	Market Share	Shipments (millions)	Market Share	
Desktop	Mature	39.1	15.10%	30.6	12.30%	-5.90%
	Emerging	64.4	25.00%	62.5	25.00%	-0.70%
	Both	103.5	40.10%	93.1	37.20%	-2.60%
Notebook	Mature	87	33.70%	83.5	33.40%	-1.00%
	Emerging	67.7	26.20%	73.4	29.40%	2.00%
	Both	154.7	59.90%	156.9	62.80%	0.40%
Total PC	Mature	126.1	48.80%	114.1	45.70%	-2.50%
	Emerging	132.1	51.20%	135.9	54.30%	0.70%
	Both	258.2	100.00%	250	100.00%	-0.80%

* CAGR refers to compound annual growth rate.

Appendix B: Recent Income Statements and Balance Sheets of Lenovo

Table B1. Income Statement of Lenovo in Millions of USD Except for Per Share Items (Google Finance, 2016d)

	Fiscal year*			
	2016	2015	2014	2013
Turnover	44,912	46,296	38,707	33,873
Operating profit	-267	953	983	802
Non-operating/exceptional items	2	1	22	-0
Associates	-11	17	9	-1
Profit before taxation	-277	971	1,014	801
Taxation	-132	134	197	170
Minority interests	-16	8	0	-4
Preference share dividend	0	0	0	0
Net profit	-128	829	817	635
Total dividend	379	380	322	248
Retained profit/(loss)	-507	449	495	387
Gross profit	6,624	6,682	5,064	4,427
Depreciation	266	208	110	92
Interest paid	179	117	47	21
Interest capitalized	0	0	0	0
Turnover growth (%)	-3	20	14	15
Net profit growth (%)	-	1	29	34
Taxation rate (%)	-	14	19	21
EPS (HKD)	-0	1	1	0
Diluted EPS (HKD)	-0	1	1	0

* The fiscal years of Lenovo and other companies listed on the Hong Kong Stock Exchange end on March 31.

Table B2. Summarized Balance Sheet of Lenovo in Millions of USD (Google Finance, 2016d)

	As at 31 March 2016	As at 31 March 2015	As at 31 March 2014
Cash and equivalents	153	744	720
Short-term Investments	89	101	94
Cash and short-term investments	2,015	2,956	3,952
Total receivables (net)	7,486	8,092	5,622
Total Inventory	2,637	2,954	2,701
Total current assets	12,967	15,507	13,401
Property/plant/equipment (total—gross)	2,622	2,529	1,659
Accumulated depreciation (total)	-1,000	-774	-640
Goodwill (net)	4,899	5,220	2,390
Intangibles (net)	3,762	4,006	950
Long-term investments	180	119	56
Other long-term assets (total)	1,503	790	542
Total assets	24,933	27,397	18,357
Accounts payable	4,501	4,835	4,860
Accrued expenses	2,049	2,265	1,359
Total current liabilities	15,760	17,448	13,462
Long term debt	2,505	1,886	10
Total debt	3,251	3,054	456
Total Liabilities	21,933	23,313	15,347
Total equity	3,000	4,084	3,010
Total liabilities and shareholders' equity	24,933	27,397	18,357

Appendix C: Geographical Analysis of Lenovo's Turnover

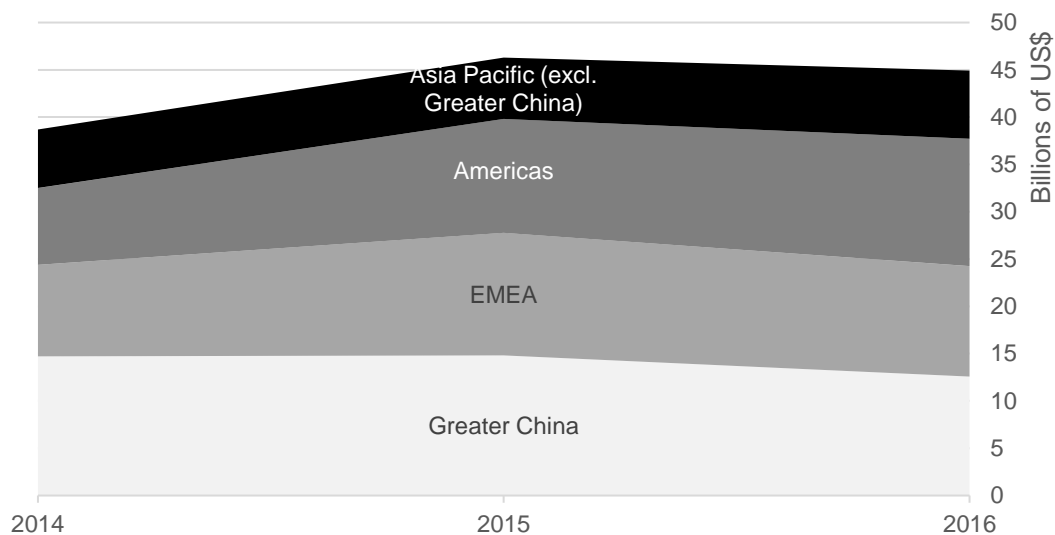


Figure C1. Geographical Analysis of Lenovo's Turnover 2014-2016 (Adapted from Lenovo, 2014; Lenovo, 2015; Lenovo, 2016b)

Appendix D: Top Management Team of Lenovo

Table D1. Top Management Team of Lenovo (Adapted from Lenovo, 2017; selected LinkedIn profiles; Google Finance, 2016d)

Name*	Gender	Age**	Current position	Since
Yuanqing Yang	Male	52	Chairman and Chief Executive Officer	2011
Gianfranco Lanci	Male	62	Corporate President and Chief Operating Officer	2015
Wai Ming Wong	Male	59	Executive Vice President and Chief Financial Officer	2014
Aymar De Lencquesaing	Male	58	Executive Vice President and Co-President of the Mobile Business Group, and Chairman and President of Motorola	2016
Liu Jun	Male		Executive Vice President and President, Lenovo China	2017
Skaugen Kirk	Male	46	Executive Vice President and President of the Data Center Group	2016
Rui Yong	Male	47	Senior Vice President, Chief Technology Officer	2016
Lan Gao	Female	51	Senior Vice President of Human Resources	
Zhiqiang He	Male	54	Senior Vice President of Lenovo Capital and Incubator Group	2016
Arthur Hu	Male		Senior Vice President and Chief Information Officer	2016
Jian Qiao	Female	49	Senior Vice President and Co-President of the Mobile Business Group China	2016
Laura Quatela	Female		Senior Vice President and Chief Legal Officer	2016
David Roman	Male		Senior Vice President and Chief Marketing Officer	2010
Luca Rossi	Male		Senior Vice President and President, Latin America (LA) and Europe, Middle East and Africa (EMEA)	2015
* Name order: given name followed by surname. ** Age current as at 2017.				

Appendix E: Financial Comparison between Lenovo and Its PC Competitors

Table E1. Summarized Income Statement of Lenovo and Its PC Competitors in Millions of USD (Adapted from Google Finance 2016a, 2016b, 2016c, 2016d)

	Lenovo OTCMKTS:LNVGY	HP NYSE:HPQ	Dell Technologies NYSE:DVMT	Apple NASDAQ:AAPL
	12 months ending 31 March 2016	12 months ending 31 March 2016	52 weeks ending 29 January 2016	52 weeks ending 24 September 2016
Total revenue	44,912	48,238	50,911	215,639
Cost of revenue (total)	38,288	39,240	42,524	131,376
Gross profit	6,624	8,998	8,387	84,263
Selling/general/adm. expenses (total)	4,482	3,840	7,851	14,194
Research and development	1,491	-1,209	1,031	10,045
Total operating expense	44,974	44,689	51,425	155,615
Operating income	-62	3,549	-514	60,024
Income before tax	-277	3,761	-1,286	61,372
Income after tax	-145	2,666	-1,168	45,687

The table reflects OTC Markets Group's record of Lenovo's income statement following an American standard.

Table E2. Summarized Balance Sheet of Lenovo and Its PC Competitors in Millions of USD (Adapted from Google Finance 2016a, 2016b, 2016c, 2016d)

	Lenovo OTCMKTS:LNVGY	HP NYSE:HPQ	Dell Technologies NYSE:DVMT	Apple NYSE:AAPL
	As of 2016-03-31	As of 2016-04-30	As of 2016-04-29	As of 2016-03-26
Cash and short-term investments	2,015.41	4,636.00	8,994.00	55,283.00
Total receivables (net)	7,485.72	6,121.00	5,075.00	19,824.00
Total inventory	2,637.32	3,547.00	1,655.00	2,281.00
Total current assets	12,966.78	15,385.00	20,764.00	87,592.00
Property/plant/equipment (total—gross)	2,622.18	5,932.00	-	54,051.00
Accumulated depreciation (total)	-999.57	-4,360.00	-	-30,848.00
Goodwill (net)	4,898.64	5,672.00	9,797.00	5,249.00
Intangibles (net)	3,762.45	-	8,663.00	3,843.00
Long-term investments	180.01	-	2,291.00	177,645.00
Other long-term assets (total)	1,502.91	1,940.00	680	7,745.00
Total assets	24,933.39	25,523.00	43,879.00	305,277.00
Accounts payable	4,501.35	9,099.00	12,412.00	25,098.00
Accrued expenses	2,048.55	6,359.00	4,193.00	21,896.00
Total current liabilities	15,760.26	16,862.00	23,948.00	68,265.00
Long-term debt	2,505.11	6,708.00	10,679.00	69,374.00
Total debt	3,250.93	6,772.00	13,144.00	79,872.00
Total liabilities	21,933.19	30,309.00	42,272.00	174,820.00
Total equity	3,000.20	-4,786.00	1,607.00	130,457.00
Total liabilities and shareholders' equity	24,933.39	25,523.00	43,879.00	305,277.00

The table reflects OTC Markets Group's record of Lenovo's income statement following an American standard.

Appendix F: Shares of the Biggest Smartphone Sellers in China

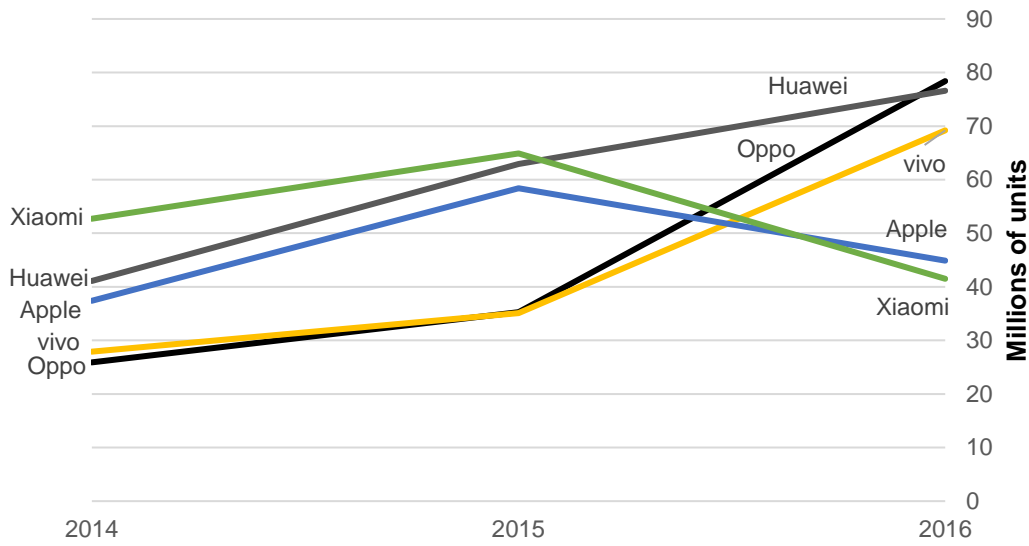


Figure F1. Shares of the Biggest Smartphone Sellers in China (IDC, 2016b; IT News 24 Hrs, 2016)

Appendix G: The Product Lifecycle

The product lifecycle describes four market stages of successful products: introduction, growth, maturity, and decline (see Figure G1). Product sales on the Y-axis represent the combined sales of the product or a category of similar products by all vendors in a market. The plot represents a typical, overall pattern of sales over the life of a product. The X-axis denotes the different stages over time, and the duration of each stage depends on a host of factors, such as product and market characteristics. Each stage corresponds to different characteristics, which has implications for many organizational functions.

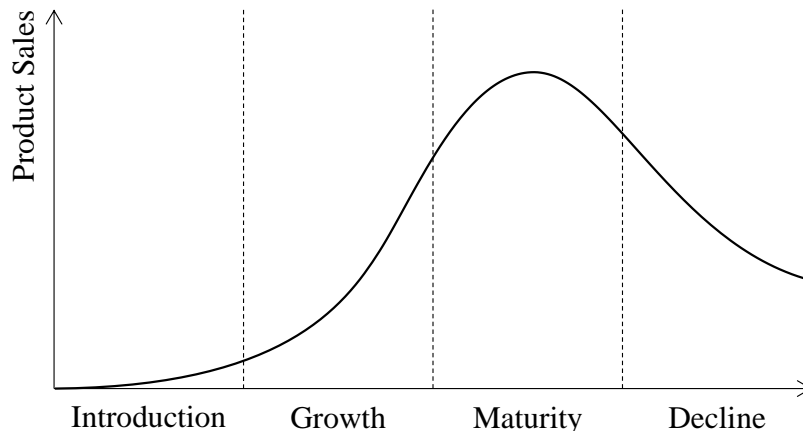


Figure G1. Product Lifecycle

In the introduction stage, organizations begin selling the products and invest considerably in product development, production, marketing, and distribution. As a result, products introduced in this stage typically sell at higher prices compared to other stages. Customers who buy technology products in this stage—often termed innovators or early adopters—tend to be more prosperous (Rogers, 2010). They often buy the products due to a desire for novelty, which leads to distinct consumption patterns compared to those who buy products in the later stages.

The growth stage features strong growth in product sales, which allows organizations to achieve economies of scale and reduce unit costs. With ensuing profits, producers and sellers may recuperate some of the investment they made earlier. In markets with low entry barriers, the growth stage tends to attract new entrants to the market, which increases competitiveness and lowers prices. Customers who buy technology products in this stage are often termed the early majority and follow somewhat more conservative adoption patterns compared to innovators and early adopters (Rogers, 2010).

The maturity stage features high sales that signal a decreasing growth rate. Established producers have typically lowered costs through their investments in the previous stages, which makes this stage their most profitable one. Competition often continues to lower prices, however. Outsiders are less attracted to enter the market and compete, and small players become increasingly wary of investment to boost their market shares. As a result, markets start to consolidate. Customers who buy products in this stage—termed the late majority—often follow a more conservative and price-conscious consumption pattern (Rogers, 2010).

The decline stage, the last stage of the product lifecycle, signals a continued but eventual slow decline of product sales and a consolidated and saturated market. Product penetration approximates a ceiling, which makes it ever harder to sell products to new customers. Those customers who adopt the product in this stage are called laggards and form the oldest and most conservative profile (Rogers, 2010). In some technology markets, replacement drives sales in this stage. In competitive markets, prices and profit margins tend to be low and include only those producers that have established economies of scale or a competitive advantage.

Hence, differences across the stages do not only indicate differences in sales but relate to a host of variables, including the likelihood of organizations entering and exiting a market, the price level, the type of customers, cash flow, and the operations required to fulfill demand. As such, the product lifecycle can serve as an important planning tool in management, finance, marketing, operations, and other organizational functions.

Appendix H: The Growth Share Matrix

The growth share matrix is a framework that Bruce Henderson, founder of the Boston Consulting Group, conceived in 1970 to help evaluate businesses. It categorizes companies' product-specific businesses⁸ according to the relative growth of the market and the size of the company's market share. The matrix results from dichotomizing these dimensions (see Figure H1).

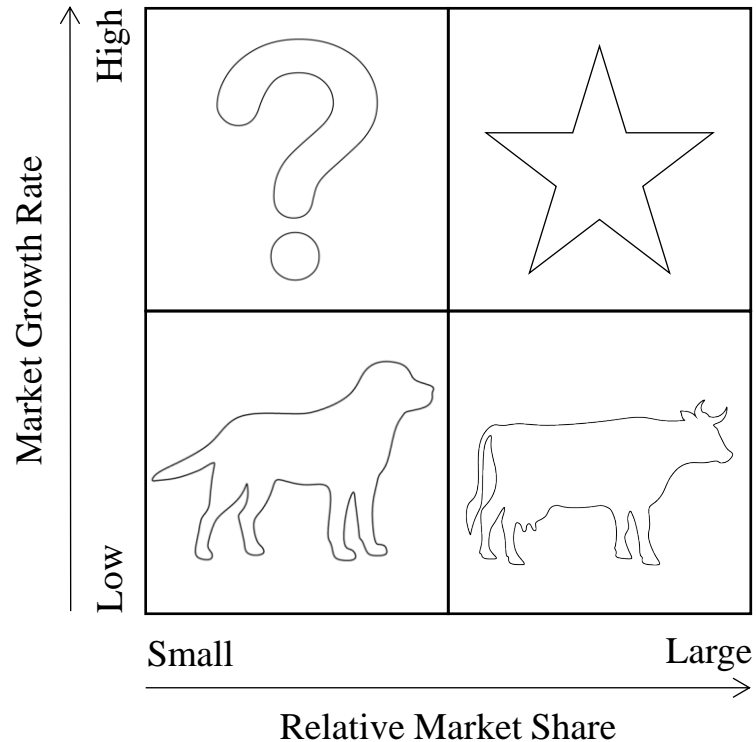


Figure H1. The Growth Share Matrix

Each cell in the matrix describes a category of business:

- *Dogs* are businesses with a low market growth rate and a small market share. Compared to other types, dogs are the least profitable and often have ongoing costs that exceed revenues. In established markets, dogs tend to have bleak prospects and are typically candidates for divestment.
- *Cash cows* are businesses with a low market growth rate and a large market share. They are more valuable than dogs because of their higher level of continued revenues. In established markets, companies tend to invest in cash cows only when defending a leading market position.
- *Question marks* are businesses with a high market growth rate and a small market share. Many new businesses start as question marks, and companies seek to convert them into stars as the market expands. Without this achievement, they risk ending up as dogs after the market matures. Thus, investing in question marks requires much attention.
- *Stars* are businesses with a high market growth rate and a large market share. Stars generate the most revenue and are the strongest factors of a company's growth. Companies tend to defend any stars they have while planning for a slowdown. Upon maturation and decline of the market growth, they may convert stars into cash cows.

By typifying businesses, the growth share matrix can help inform investment decisions with regard to a product portfolio. Henderson (1970) writes:

⁸ "Business" here refers to the commercial activity in a company regarding a type of product or service. Thus, a company can have one or multiple businesses.

The balanced portfolio has Stars whose high share and high growth assure the future, Cash Cows that supply funds for that future growth, and Question Marks to be converted into Stars with the added funds.

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