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LENOVO: BEING ON TOP IN A DECLINING INDUSTRY

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

Yang Yuanqing, Chairman and CEO, Lenovo[1]

For the first time since the 2008 financial crisis, Lenovo, the world's largest PC maker, not only had failed to increase its revenues and profits, but had a net loss. Lenovo's market share was still growing, but the PC market itself was shrinking about 5% annually [see **Exhibit 1**].

Lenovo had hoped that the 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, as Lenovo faced strong competition in local and international markets. Its position among the smartphone vendors in China dropped from 2nd to 11th between 2014 and 2016, while its worldwide market share shrank from 13% to 4.6%. In 2016, its smartphones group showed an operational loss of US$469 million.[2]

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 for improved profitability through market consolidation and product innovation. The smartphones group focused on positioning the brand, improving margins, streamlining distribution channels and expanding geographical reach.

It was not clear, however, how the company could thrive in a declining PC industry. Nor was it obvious 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.

[1] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed 25 April 2017)
[2] Ibid.

Dr. Sander Paul Zwanenburg prepared this case under the supervision of Professor Ali Farhoomand for class discussion. This case is not intended to show effective or ineffective handling of decision or business processes.

Ref. 17/602C

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.

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.[3] It manufactured a variety of computers, from smartphones to servers. Its sales were US$45 billion in fiscal year 2016. [See **Exhibits 2** and **3** for Lenovo's income statement and balance sheet.]

Three decades earlier, the company, then called Legend, had started in a small Beijing bungalow. Liu Chuangzhi, a computer scientist, and 10 engineers founded the company in 1984, aiming 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, as many of the founders lacked business experience and concentrated only on product quality.

> *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.*
>
> Liu Chuanzhi, Founder of Lenovo[4]

Growth

The initial struggles helped the company learn about the latest computing technology from abroad and the consumer market in China.[5] The company's first success was in developing circuit boards to enable PCs by IBM to process Chinese characters.[6] 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 *Lenovo*, consisting 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 at the core. It grew rapidly thanks to a quickly expanding Chinese PC market. Its share mushroomed from 14% in 1998 to 30% in 2000.[7] 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. The company's turnover almost quadrupled in size.[8]

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.

[3] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed 25 April 2017); Lenovo (2016) "About Us", http://www.lenovo.com/lenovo/us/en/ (accessed 25 April 2017).
[4] Ling, Zhijun (2006). *The Lenovo Affair*, John Wiley & Sons: Singapore.
[5] Marshall, T. (2001) "Little-Known PC Maker Is Legend in the Making", *Los Angeles Times*, http://articles.latimes.com/2001/sep/02/business/fi-41124 (accessed 25 April 2017).
[6] Ling, Zhijun (2006). *The Lenovo Affair*, John Wiley & Sons: Singapore.
[7] Marshall, T. (2001) "Little-Known PC Maker Is Legend in the Making", *Los Angeles Times*, http://articles.latimes.com/2001/sep/02/business/fi-41124 (accessed 25 April 2017).
[8] Fiscal years of Lenovo end on 31 March; Lenovo (2006) "Annual Report".

In the decade after acquiring IBM's PC division, Lenovo realized steady growth in revenues, except for one year during the financial crisis.[9] The primary drivers of growth were an increase in PC sales and the acquisition of new businesses. In 2011, the company 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 company.[10] These acquisitions helped Lenovo 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% in Greater China, 17.5% in Asia-Pacific (excluding Greater China), 13.7% in the Americas and 20.0% in Europe, the Middle East and Africa.[11] [See **Exhibit 4** 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 4% 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".[12] 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.[13] 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.

> *[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.*
>
> Yang Yuanqing, Chairman and CEO of Lenovo[14]

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. These acquisitions were to serve Lenovo's objective of providing consumers and organizations with computing solutions that included both traditional hardware and internet-based services.[15] 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, representing less than 2% of Lenovo's revenue in 2016, its Enterprise Business Group grew from 1% of revenues in 2014 to 10% in 2016.

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, North Carolina; and Singapore. Seven of its nine research centers were in China, one in Japan and one in the US, while its sales centers were in the US, France, China and Singapore. With these centers around

[9] The financial crisis peaked in 2008, causing Lenovo to report a decline in profits for fiscal year 2009.
[10] Lenovo sold CCE back to its original owners a few years later.
[11] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).
[12] Lenovo (2008) "Annual Report".
[13] Shah, A. (2010) "Lenovo Calls New Smartphone Central to Mobile Strategy", *PC World*, http://www.pcworld.com/article/186127/lenovo_smartphone.html (accessed April 25, 2017).
[14] Ling, Zhijun (2006). *The Lenovo Affair*. John Wiley & Sons: Singapore.
[15] Lenovo (2012) "Lenovo Acquires Stoneware To Expand Secure Cloud Computing", http://news.lenovo.com/news-releases/lenovo-acquires-stoneware-to-expand-secure-cloud-computing.htm (accessed April 25, 2017).

the world, Lenovo tried to be both global and local at the same time, embracing differences across markets to capitalize quickly on new ideas and opportunities in different locations.

Its top management team consisted of six corporate executives (CxOs), most of whom had been appointed in the last five years. Others on the team were all executive vice presidents or senior vice presidents, and led various groups or divisions, as shown in **Error! Reference source not found.** 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".[16] It hired people from all walks of life but with the common aspiration of achieving excellence in delivering unparalleled products. To this end, the management emphasized teamwork, entrepreneurship and innovation and aimed to transform Lenovo from a device-oriented company to a more customer-centric company. Mr. Yang said:

> *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.*[17]

Mr. 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 were using had been increasing. Serving those needs required centralizing the user, not the device. Yang said:

> *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.*[18]

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, seeing them no longer as end products but as entry points for experiencing content and services. According to Mr. Yang:

> *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.*[19]

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, as shown in **Figure 1**.

[16] Lenovo (2016) "About us: Diversity", http://www.lenovo.com/lenovo/us/en/diversity.html (accessed April 25, 2017).
[17] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).
[18] Ibid.
[19] Ibid.

- The *Mobile Business Group* focused on smartphones, with one subgroup concentrating on China, where it had accumulated much experience, and another on the rest of the world, where it saw much potential to grow.
- The *Data Center Group*, previously called *Enterprise*, accounted for 10% of revenues but was seen as key to delivering a valuable product portfolio for enterprise customers, now and in the future.
- 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 aimed to maximize 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 even within product groups, depending on geography.

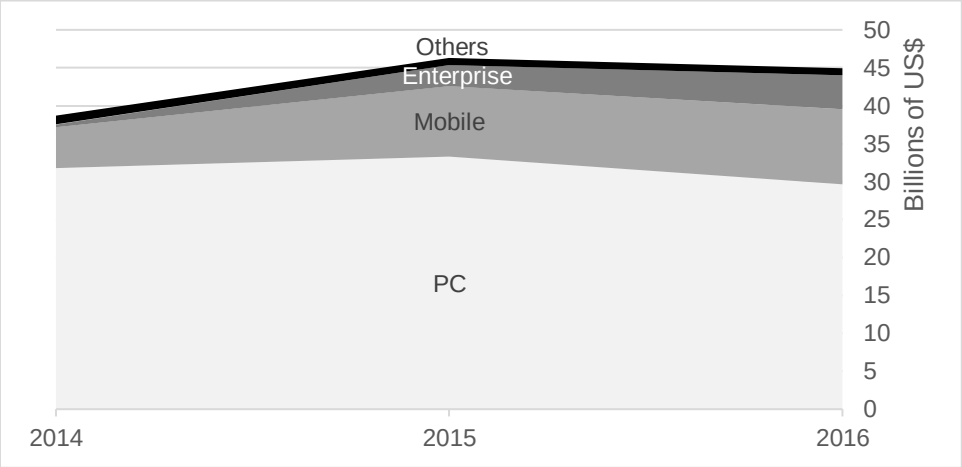

Figure 1: Analysis of Lenovo's revenue by group and fiscal year (in billions of US dollars)[20]

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. Mr. Yang said:

> *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.*[21]

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

[20] Data compiled from Lenovo's annual reports; fiscal years end on March 31.
[21] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).

One change was the diversification of form factors. Desktop computers had long been the dominant form of computers, until laptop sales overtook desktop sales in 2008.[22] In 2010, the first successful tablet computer—Apple's iPad—was introduced and attracted much attention. Tablets filled a gap between smartphones and laptops in terms of portability, screen size and computing power, fitting into many everyday situations. The rapid adoption of tablets caused their sales to overtake that of laptops in 2011.[23] As tablets rose in popularity, vendors hoped to fill more gaps on the same continuum. Some introduced *phablets*, situated between smartphones and tablets,[24] and *convertibles*, 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, the diversification had caused quite a stir. Many tablet vendors came and went after Apple introduced its first iPad.[25] In 2011, Apple alone owned 60% 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 for conveniently handled 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, as shown in **Figure 2**.[26] Convertibles resembled laptops more closely and were expected to more often *replace* traditional forms of PCs than tablets did.

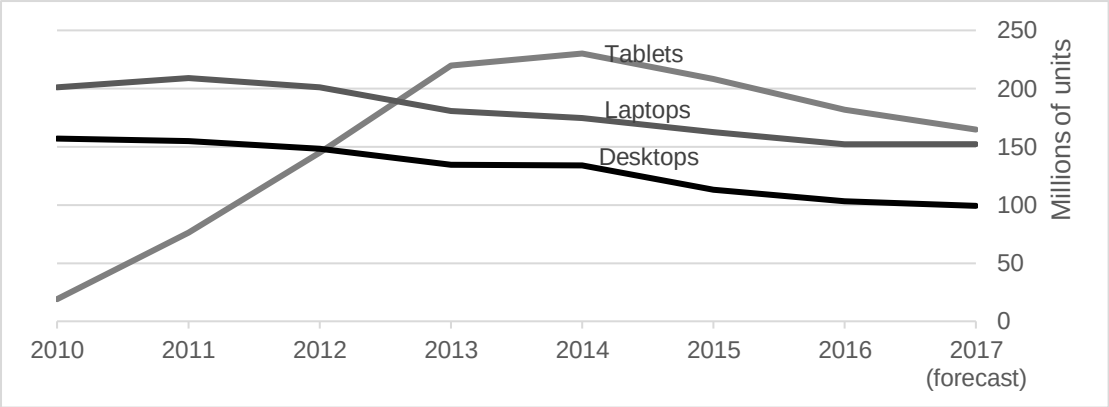

Figure 2: Worldwide sales of PCs by type and year (in millions of units)

Relying less on a single computer, people waited longer to upgrade their PC. It also became easier to run modern operating systems on older machines. The average upgrade cycle slowed from about four years to five or six years in 2016.[27] Holding onto their desktops and laptops,

[22] Hartley, A. (2008) "Laptop sales overtake desktops", *Techradar*, http://www.techradar.com/news/laptops/mobile-computing/computing/laptop-sales-overtake-desktops-497004 (accessed April 25, 2017).
[23] ABI Research (2011) "Media Tablets Eclipse Netbook Sales for the First Time in 2Q11", https://www.abiresearch.com/press/media-tablets-eclipse-netbook-sales-for-the-first-/ (accessed April 25, 2017).
[24] Phablets, smartphones and smartwatches were not a product of Lenovo's PC group.
[25] Statista (2016) "Global tablet market share held by tablet vendors from 2nd quarter 2011 to 2nd quarter 2016", https://www.statista.com/statistics/276635/market-share-held-by-tablet-vendors/ (accessed April 25, 2017).
[26] Pew Research Center (2015) "Technology Device Ownership: 2015", http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/ (accessed April 25, 2017).
[27] Shah, A. (2016) "The PC upgrade cycle slows to every five to six years, Intel's CEO says", *PC World*, http://www.pcworld.com/article/3078010/hardware/the-pc-upgrade-cycle-slows-to-every-five-to-six-years-intels-ceo-says.html (accessed April 25, 2017).

and acquiring new forms of computers, households owned an increasing number of internet-connected devices.[28] The average household in the UK, for example, owned seven.[29]

The average selling prices across all PC makers tended to decrease slowly over time.[30] The average per-PC profit of the largest PC vendors hovered around a mere US$15, with the average profit margin often between 2% and 3%.[31] These cutthroat conditions exerted much pressure on all vendors, especially those without economies of scale.

With high price pressure 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% in 2011 to 57% 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% in 2011 to 21% in 2016, as shown in **Figure 3**.[32]

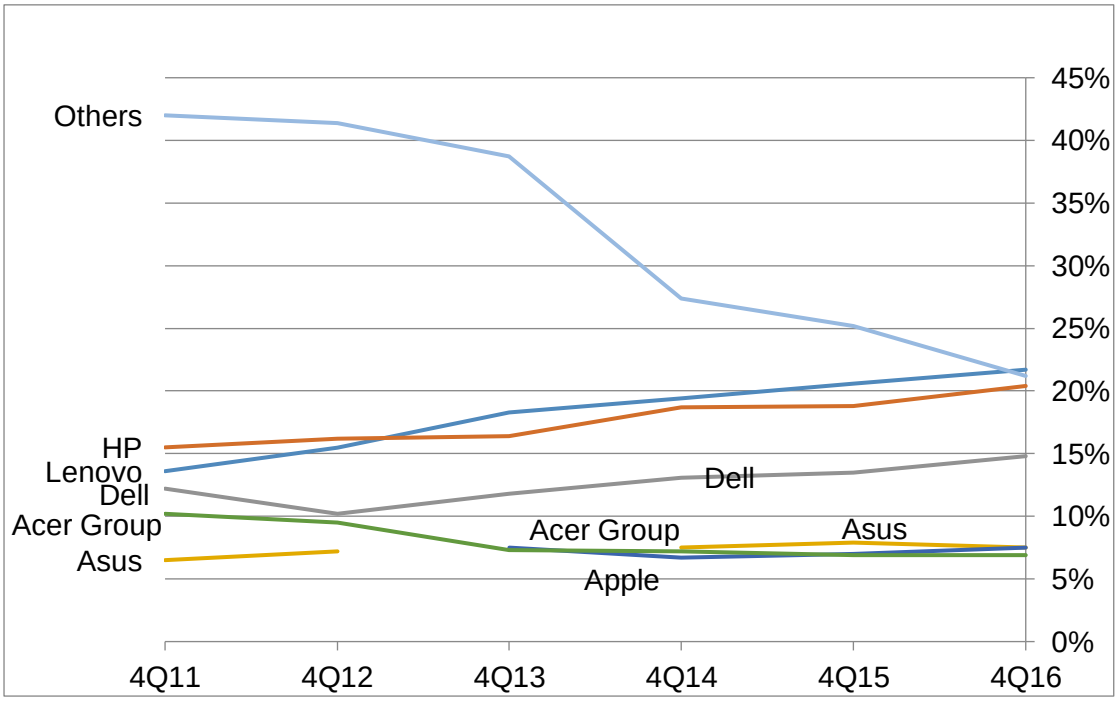

Figure 3: Vendors' shares of worldwide sales of PCs (in units, excluding tablets) in the fourth quarters of 2011 to 2016[33]

[28] TekCarta (2013) "Personal Computers per Household (68 countries)", https://www.nakono.com/tekcarta/databank/personal-computers-per-household/ (accessed April 25, 2017).

[29] Associated Press (2015) "Online all the time—average British household owns 7.4 internet devices", *The Guardian* https://www.theguardian.com/technology/2015/apr/09/online-all-the-time-average-british-household-owns-74-internet-devices (accessed April 25, 2017).

[30] Arthur, C. (2014) "How the 'value trap' squeezes Windows PC makers' revenues and profits", *The Guardian,* https://www.theguardian.com/technology/2014/jan/09/pc-value-trap-windows-chrome-hp-dell-lenovo-asus-acer (accessed April 25, 2017).

[31] Ibid.

[32] Data include desk-based PCs, notebook PCs and ultra-mobile premiums (such as Microsoft Surface), but not Chromebooks or iPads; Gartner (2016) "Gartner Says Worldwide PC Shipments Declined 5.7% in Third Quarter of 2016", http://www.gartner.com/newsroom/id/3474218 (accessed April 25, 2017).

[33] Data on Asus in 2013 and on Apple in 2011 and 2012 were missing; sources include six annual Garner reports, referred to on Wikipedia, https://en.wikipedia.org/wiki/Market_share_of_personal_computer_vendors (accessed April 25, 2017).

Realizing higher volumes in traditional PCs was not going to get any easier in the future. In its predictions up to 2020, IDC, a research firm, forecasted a 1% compounded annual decline.[34] Desktops sales would decline by 5.9% annually in mature markets and by 0.7% in emerging markets, whereas laptop sales would decline in mature markets (–1%), and grow in emerging markets (+2%). [See **Exhibit 1** for more details on this forecast.]

Realizing product innovations was often more a necessity than a path toward outstanding growth. At the 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. Mr. Yang pointed out:

> *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.*[35]

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 increasingly popular way to serve consumers and enterprise customers with continued and integrated computing services.[36]

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, with most of its revenue from PCs. In late 2015, HP spun off its large Enterprise division, which accounted for 250,000 employees.[37] Meanwhile, it increasingly outsourced the assembly of its products to contract manufacturers worldwide.[38] While the average sales price of HP was declining, HP seemed to benefit from sales of higher-end laptops and convertibles, helping it improve its operating margin to about 4.2% in 2016. [See **Exhibits 6** and **7** for financial information about Lenovo's main competitors.]

Dell—a computer hardware company that was founded in 1984 and became private in 2013—was the world's third largest vendor of traditional PCs. 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, making it the largest-ever acquisition in the technology sector.

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[34] IDC (2016) "PC Market Outlook Improves Mildly with Faster Shift to Slim and Convertible Models", http://www.idc.com/getdoc.jsp?containerId=prUS41969516 (accessed April 25, 2017).

[35] WARC (2012) "Lenovo seeks to build its brand", https://www.warc.com/NewsAndOpinion/News/30086? (accessed April 25, 2017).

[36] Arthur, C. (2014) "How the 'value trap' squeezes Windows PC makers' revenues and profits", *The Guardian,* https://www.theguardian.com/technology/2014/jan/09/pc-value-trap-windows-chrome-hp-dell-lenovo-asus-acer (accessed April 25, 2017).

[37] The Economist (2015) "Hewlett-Packard: Growing old, but not together", http://www.economist.com/news/business/21677635-hps-break-up-will-not-solve-all-its-problems-growing-old-not-together (accessed April 25, 2017).

[38] Chao, L. (2012) "As Rivals Outsource, Lenovo Keeps Production In-House", *Wall Street Journal,* https://www.wsj.com/articles/SB10001424052702303302504577325522699291362 (accessed April 19, 2017).

The PC sales of Apple, Acer and Asus had been ranking just below those of Lenovo, HP, and Dell. Apple, one of the world's most valuable brands, had always offered desktops that integrated applications, the operating system, the computing hardware and its 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, within 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.[39]

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's orientation was similar to Acer's. It offered a broad range of computing products, including smartphones, and aimed to expand this range. It also focused on various aspects of innovation, including portability, power efficiency and sustainability.[40]

Smartphones

In 2016, Lenovo was responsible for about 4.6% of global sales. Its smartphone sales had fluctuated, with a decline in shipments and market share. Lenovo wanted to change this.

The smartphone market was vibrant and its growth trajectory had been steep, as shown in **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.[41] Smartphone sales surpassed PCs sales in late 2010 and outsold them four to one in 2015.[42] This growth caught the attention of many technology companies and fueled much investment. Patent wars broke out, while billion-dollar partnerships were forged.

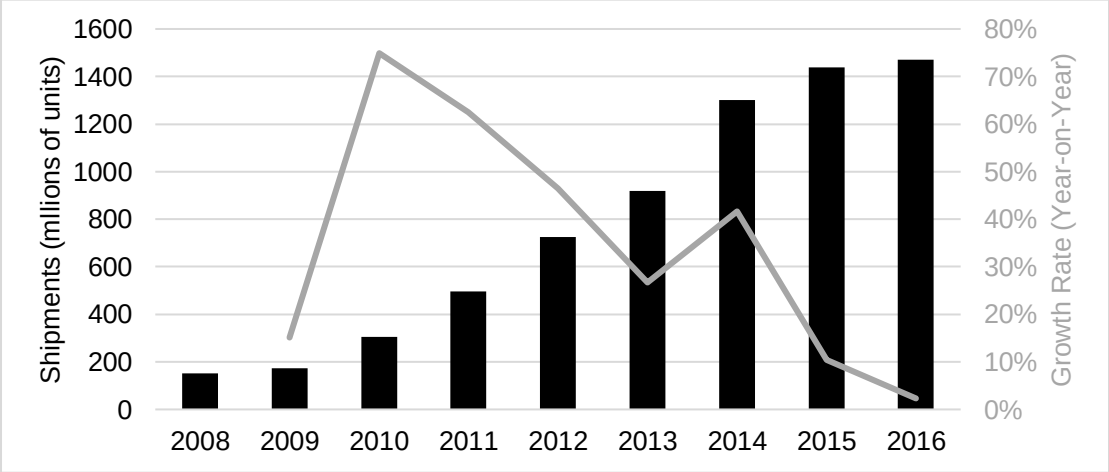


Figure 4: Worldwide shipments of smartphones (in units and year-on-year growth)

[39] Arthur, C. (2014) "How the 'value trap' squeezes Windows PC makers' revenues and profits", *The Guardian,* https://www.theguardian.com/technology/2014/jan/09/pc-value-trap-windows-chrome-hp-dell-lenovo-asus-acer (accessed April 25, 2017).

[40] ASUSTeK Computer Inc. (2015) "Annual Report", http://asus.todayir.com.tw/attachment/20160601113706462443472_en.pdf (accessed April 21, 2017).

[41] Statista (2016) "Number of smartphones sold to end users worldwide from 2007 to 2016 (in million units)", https://www.statista.com/statistics/263437/global-smartphone-sales-to-end-users-since-2007/ (accessed April 25, 2017).

[42] Albenesius, C. (2011) "Smartphone Shipments Surpass PCs for First Time. What's Next?", *PC Magazine,* http://www.pcmag.com/article2/0,2817,2379665,00.asp (accessed April 25, 2017).

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. This 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, lowering 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 makers of PCs, had less control over the consumer-oriented activities in distribution, marketing, sales and customer relationships.

After years of double-digit growth, in 2016, the smartphone market was cooling: a 2% growth in shipments was recorded worldwide, with some geographic markets in decline. Countries varied in their telecom infrastructure, local service providers and competitors. Adoption rates varied widely too, correlating strongly with GDP, as shown in **Figure 5**.[43]

> *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.*
>
> Yuanqing Yang[44]

Figure 5: Portion of adults who report owning a smartphone in 2015, in percent, by country[45]

[43] Poushter, Jacob (2016) "Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies", Pew Research Center, http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/ (accessed April 25, 2017).

[44] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).

[45] Poushter, Jacob (2016) "Smartphone Ownership and Internet Usage Continues to Climb in Emerging Economies", Pew Research Center, http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/ (accessed April 25, 2017).

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% of the market, second only to Samsung. In the following years, however, operators in China slashed the smartphone subsidies that Lenovo relied on.[46] New entrants like 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. Mr. Yang said:

> *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.*[47]

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, as Lenovo faced tough competitors across all price levels. [See **Exhibit 8** 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, achieving ranks one and three in 2016, with 17% and 15%, respectively.[48] They quickly developed smartphones, adopted the latest technology and aggressive ad campaigns, and sold them at low prices. They wanted to grow internationally, with 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, making 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, for about 60% 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.

[46] Bloomberg (2014) "China Mobile Taking Steps to Cut Smartphone Subsidies", https://www.bloomberg.com/news/articles/2014-09-26/china-mobile-taking-steps-to-cut-smartphone-subsidies (accessed April 25, 2017).

[47] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).

[48] IDC (2016) "Top 3 Chinese Smartphone Vendors Grab Nearly Half of China's Market in 2016, says IDC", http://www.idc.com/getdoc.jsp?containerId=prAP42292517 (accessed April 25, 2017).

Newcomer Xiaomi stunned its smartphone competitors. In just four years, it gained a 15% 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%.[49]

Apple was also losing ground, but not as fast. 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. 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 was rising by the day. In the higher-end segment, this made China a mature market, driven more by replacement than by initial adoption.

Outside of China

The difficulties in China led Lenovo to shift its ambitions to markets elsewhere. While it had not established leadership in any geographical location, it had grown in emerging markets. The company aimed to continue 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. This allowed Lenovo to report record-high shipment growth in three geographies in 2016. In Asia-Pacific (excluding China), it realized 96% year-on-year growth; in Europe, the Middle East and Africa, it realized 83% growth, and in Latin America, it realized 46% growth.[50] 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.

Mature markets were a cause of concern. Lenovo's product transition in North America was taking longer than expected, resulting in a decline of 13% in global shipments in fiscal 2016. Consumers and businesses were not choosing Lenovo to replace their smartphones, but opted for Samsung, Apple or Huawei.

Samsung had been the market leader since the demise of BlackBerry and the downfall of Nokia. As the world's largest consumer electronics company, it 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.[51] 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. New Chinese manufacturers were increasingly seen as a threat, causing Samsung's global share to drop from 30% in 2012 to about 20% 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

[49] Ibid.

[50] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).

[51] Grobart, S. (2013) "How Samsung became the world's No. 1 smartphone maker—and its plans to stay on top", Bloomberg, https://www.bloomberg.com/news/articles/2013-03-28/how-samsung-became-the-worlds-no-dot-1-smartphone-maker (accessed April, 25 2017).

create a more transformative user experience, leading to enhanced brand loyalty and higher margins, which at times exceeded 100% of the total market profits.[52]

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% in 2012 to 10.6% in 2016, thus positioning 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.

Smartphone Innovation by Lenovo

Lenovo had made some bold moves in the last few years, buying Google's Motorola Mobility and liaising with Google to equip smartphones with augmented reality. Yet the task of taking on Samsung, Apple and Huawei was daunting.

Motorola had had an 85-year history in the US and possessed two valuable brands that were well known to Americans: Motorola itself and Moto. Its relationships with US operators allowed for an ongoing deal with Verizon and placement of 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.

The realization of this promise was only marginal and momentary. In the first quarter of 2015, Lenovo reached the third position with 5.6%, just above Huawei with 5.2% and well under Samsung, with 24.6%, and Apple, with 18.3%.[53] 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.[54] It revamped its high-end product line with Moto Z phones, featuring a 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.[55] At Google, a project to make a modular smartphone was stranded. [56] The lead engineer of this project said:

[52] Reisinger, D. (2016) "How Apple Nabbed 104% of Smartphone Profits Last Quarter", *Fortune*, http://fortune.com/2016/11/04/apple-smartphone-profits/ (accessed April 25, 2017).

[53] Statista (2016) "Global market share held by leading smartphone vendors from 4th quarter 2009 to 4th quarter 2016", https://www.statista.com/statistics/271496/global-market-share-held-by-smartphone-vendors-since-4th-quarter-2009/ (accessed April 24, 2017).

[54] Whitwam, R. (2016) "Motorola almost completely gutted by Lenovo following new round of layoffs", Extreme Tech, https://www.extremetech.com/mobile/236421-motorola-almost-completely-gutted-by-lenovo-following-new-round-of-layoffs (accessed April 25, 2017).

[55] Savov, V. (2016) "The Moto Z is a good phone headed down the wrong path", *The Verge*, http://www.theverge.com/2016/7/22/12250044/lenovo-moto-z-mods-modular-phone-lg (accessed April 25, 2017).

[56] Statt, N. (2016) "Google confirms the end of its modular Project Ara smartphone", *The Verge*, http://www.theverge.com/2016/9/2/12775922/google-project-ara-modular-phone-suspended-confirm (accessed April 25, 2017).

> *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.*
>
> Rafa Camargo, lead engineer, Project Ara at Google[57]

The Moto brand, including its Moto Z, was launched in most of Lenovo's markets worldwide. In India and Brazil, it did well, but by 2016, Motorola had not yielded the overall results Lenovo had hoped for.[58] Mr. Yang suggested that internal issues were a reason: "Integration efforts did not meet expectations," adding that Lenovo continued its endeavor to align Motorola Mobility with Lenovo "to leverage the complementary strengths, streamline the product portfolio, improve efficiency and enhance the cost structure."[59]

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. A user could put any digital object in a 3D model of his or her 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.[60] Competitors of Lenovo followed suit, with Asus announcing it would launch a Tango phone in 2017.[61]

Cross-Product Synergies

While the smartphone market was clearly different from the PC market, coordinating the two businesses could help organizations like Lenovo achieve synergies.

Like PCs, smartphones consisted of 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 were different 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, 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 flexible planning of production capacities could enable more manufacturing efficiency, lowering 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. This would not only apply to retail

[57] Hollister, S. (2016) "Inside Project Ara, Google's Lego-like plan to disrupt the smartphone", CNet, https://www.cnet.com/news/google-project-ara-hands-on-rafa-camargo-interview-modular-phones/ (accessed April 25, 2017).
[58] Savov, V. (2016) "Lenovo: Motorola acquisition 'did not meet expectations'", *The Verge*, http://www.theverge.com/2016/5/26/11782808/lenovo-motorola-acquisition-did-not-meet-expectations (accessed April 25, 2017).
[59] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).
[60] Velazco, C. (2016) "Lenovo Phab 2 Pro review: Stumbling out of the Gate", Engadget, https://www.engadget.com/2016/11/23/lenovo-phab-2-pro-review/ (accessed April 25, 2017).
[61] ASUS (2016) "ASUS Presents Zennovation at CES 2017", https://www.asus.com/News/9olCPSl3dLtFDEjL/ (accessed April 25, 2017).

stores, but also to online resellers. Cross-selling PCs and smartphones to corporate customers could also become more lucrative.[62]

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. Even though Lenovo did not have such ecosystem, Mr. Yang saw possibilities:

> *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.*[63]

Looking Forward

> *Building PCs and smartphones has been our core business. And many customer scenarios are addressed simply by having a great device. This will always be our core and we will always protect this device-first business.*
>
> Yang Yuanqing, Chairman and CEO, Lenovo [64]

Lenovo seemed able, financially, 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 signs of ending, Lenovo could likely continue to profit from PCs, at least in the next few years. 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. Mr. Yang wondered how Lenovo could deploy its vast resources most effectively.

[62] Gartner (2016) "Gartner Survey Shows That Mobile Device Adoption in the Workplace Is Not Yet Mature", http://www.gartner.com/newsroom/id/3528217 (accessed 27 April 2017).
[63] Lenovo (2016) "Annual Report", https://www.lenovo.com/ww/lenovo/pdf/report/E_099220160603a.pdf (accessed April 25, 2017).
[64] Ibid.

APPENDIX 1: THE PRODUCT LIFE CYCLE

The product life cycle describes four market stages of successful products—introduction, growth, maturity and decline—as shown in **Figure 6**. 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, with the duration of each stage dependent on a host of factors, including product and market characteristics. Each stage corresponds to different characteristics, with implications for many organizational functions.

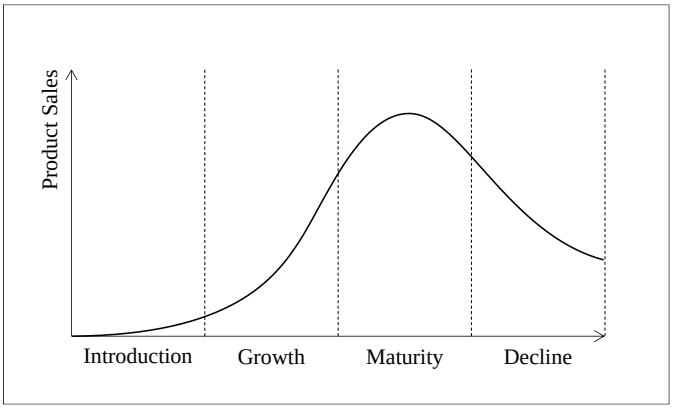


Figure 6: Product life cycle

The introduction stage is marked by the commencement of sales and considerable investment in terms of product development, production, marketing and distribution. These costs are often reflected in higher prices compared to other stages. Customers buying technology products in this stage—often termed innovators or early adopters—tend to be more prosperous.[65] Their motivation is often driven by a desire for novelty, leading to distinct consumption patterns compared to those buying the product in later stages.

The growth stage is characterized by strong growth in product sales. This allows for realizing economies of scale and reductions in 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, increasing competitiveness and lowering prices. Customers buying technology products in this stage are often termed the early majority, and follow somewhat more conservative adoption patterns compared to the Innovators and early adopters.[66]

The maturity stage is marked by high sales that the growth rate is decreasing. Established producers have typically lowered costs through their investments in the previous stages, making this their most profitable stage. 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.[67]

The decline stage, the last stage of the product life cycle, signals a continued but eventual slow decline of product sales, and a consolidated and saturated market. Product penetration approximates a ceiling, making it ever harder to sell products to new customers. Those

[65] Rogers, E.M. (2010) *Diffusion of Innovations*, 4th Edition, The Free Press: New York.
[66] Ibid.
[67] Ibid.

customers who adopt the product in this stage are called laggards, and form the oldest and most conservative profile.[68] In some technology markets, sales in this stage are driven by replacement. In competitive markets, prices and profit margins tend to be low, with only those producers remaining that have established economies of scale or a competitive advantage.

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

[68] Rogers, E.M. (2010) *Diffusion of Innovations*, 4th Edition, The Free Press: New York.

APPENDIX 2: THE GROWTH SHARE MATRIX

The growth share matrix is a framework conceived in 1970 by Bruce Henderson, founder of the Boston Consulting Group, to help evaluate businesses. It categorizes companies' product-specific businesses according to the relative growth of the market and the size of the company's market share. The matrix results from dichotomizing these dimensions, as shown in **Figure 7**.

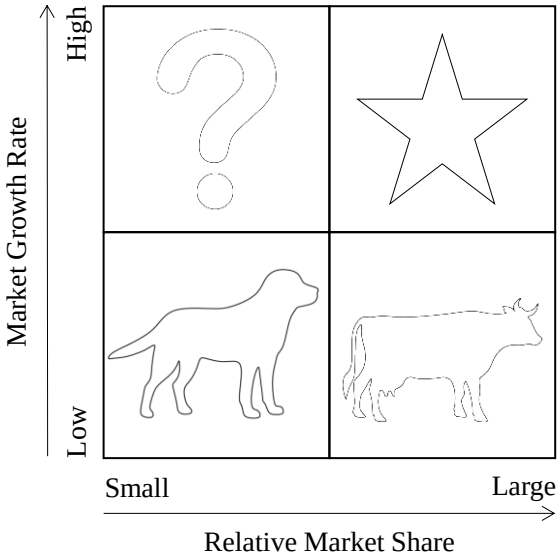


Figure 7: Growth share matrix

Each cell in the matrix describes a category of business:

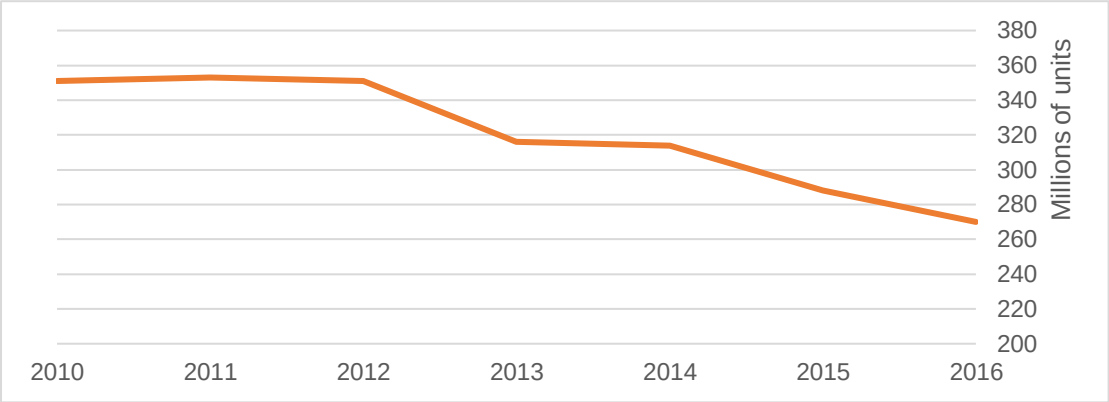
- *Dogs* are businesses with a low market growth rate and a small market share. Compared to other types, dogs are the least profitable, often with ongoing costs that exceed revenues. In established markets, dogs tend to have bleak prospects and are typically candidates for divestment.
- *Cash cows* are 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 aim to convert them into stars as the market expands. Without this achievement, they risk ending up as dogs after the market matures. Investment in question marks thus 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 wrote:

> *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.*[69]

[69] Henderson, B. (1970) "The Product Portfolio", *BCG Perspectives*, https://www.bcgperspectives.com/content/classics/strategy_the_product_portfolio/ (accessed 12 July 2017).

EXHIBIT 1: WORLDWIDE SHIPMENTS OF PERSONAL COMPUTERS



Source: Gartner (2011-2016) Annual reports on worldwide PC Shipments, http://www.gartner.com/ (accessed April 25, 2017).

Product Category	Region	2016		2020 (Forecast)		5-Year CAGR[70]
		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%**

Source: IDC (2016) "PC Market Outlook Improves Mildly with Faster Shift to Slim and Convertible Models", http://www.idc.com/getdoc.jsp?containerId=prUS41969516 (accessed 27 April 2017).

[70] CAGR refers to Compound Annual Growth Rate.

EXHIBIT 2: INCOME STATEMENT OF LENOVO

In Millions of USD (except for per share items)	Fiscal year[71]			
	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

Source: Google Finance (2016) "Lenovo Group Limited (HKG:0992)", https://www.google.com/finance?q=HKG%3A0992&fstype=ii&ei=TeX-WIi-Iomt0ATL5pWgCQ (accessed April 25, 2017).

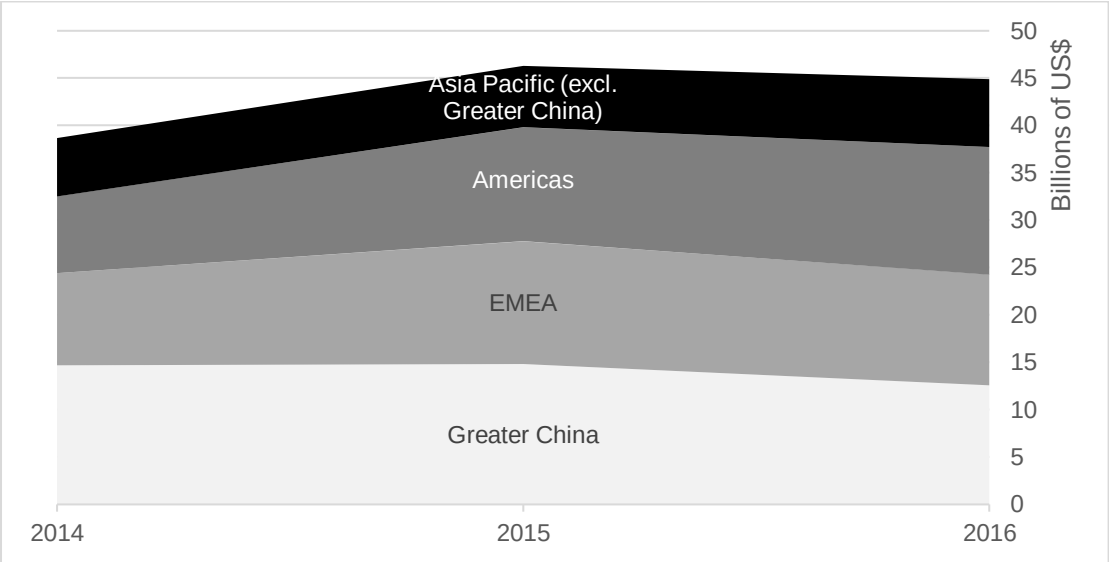
[71] The fiscal years of Lenovo and other companies listed on the Hong Kong Stock Exchange end on March 31.

EXHIBIT 3: SUMMARIZED BALANCE SHEET OF LENOVO

In Millions of USD	As of 2016-03-31	As of 2015-03-31	As of 2014-03-31
Cash & 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 & Shareholders' Equity	24,933	27,397	18,357

Source: Google Finance (2016) "Lenovo Group Limited (HKG:0992)", https://www.google.com/finance?q=HKG%3A0992&fstype=ii&ei=TeX-WIi-Iomt0ATL5pWgCQ (accessed April 25, 2017).

EXHIBIT 4: GEOGRAPHICAL ANALYSIS OF LENOVO'S TURNOVER



Source: Lenovo (2014-2016) "Annual Reports".

EXHIBIT 5: TOP MANAGEMENT TEAM OF LENOVO

Name[72]	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

Source: Compiled by the case writer from the following sources: Lenovo (2017) "About us: Management", http://www.lenovo.com/lenovo/us/en/management.shtml (accessed October 3, 2017); selected LinkedIn profiles; and Google Finance.

[72] The name order of all members is given name followed by surname.

EXHIBIT 6: SUMMARIZED INCOME STATEMENT OF LENOVO AND ITS PC COMPETITORS[73]

In Millions of USD	**Lenovo** OTCMKTS:LNVGY	**HP Inc** NYSE:HPQ	**Dell Technologies** NYSE:DVMT	**Apple** NYSE:AAPL
	12 months ending 2016-03-31	12 months ending 2016-10-31	52 weeks ending 2016-01-29	52 weeks ending 2016-09-24
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 & 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

Source: Google Finance.

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

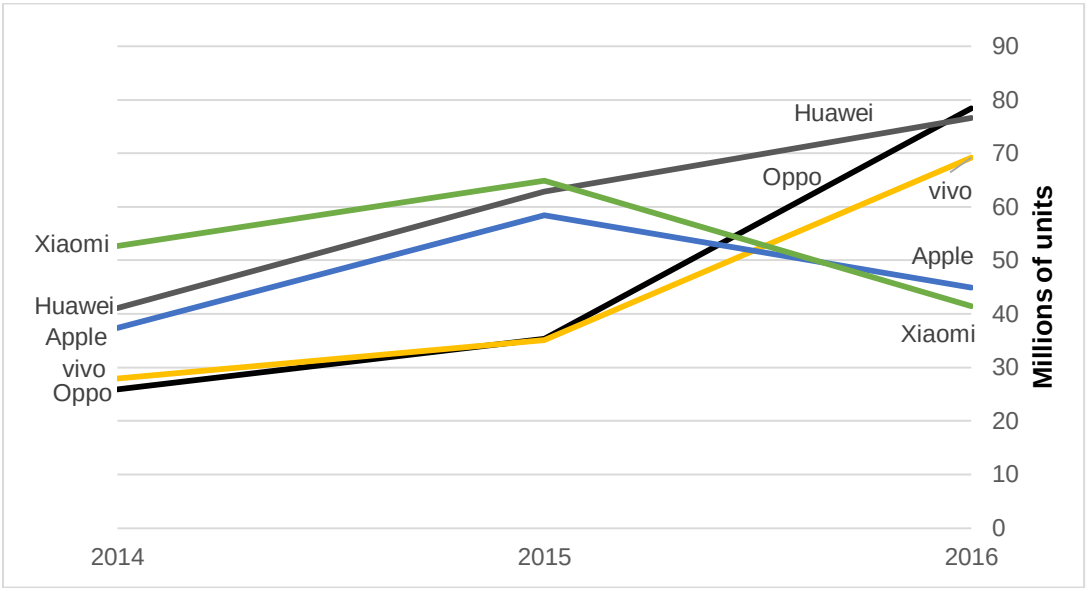
EXHIBIT 7: SUMMARIZED BALANCE SHEET OF LENOVO AND ITS PC COMPETITORS[74]

In Millions of USD	**Lenovo** OTCMKTS:LNVGY	**HP Inc** 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 & Shareholders' Equity	24,933.39	25,523.00	43,879.00	305,277.00

Source: Google Finance.

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

EXHIBIT 8: SHARES OF THE BIGGEST SMARTPHONE SELLERS IN CHINA



Sources: IDC (2017) "Top 3 Chinese Smartphone Vendors Grab Nearly Half of China's Market in 2016, says IDC", http://www.idc.com/getdoc.jsp?containerId=prAP42292517 (accessed 25 April 2017); and older IDC reports at http://www.idc.com.