Strategic analysis of Canon

Research Project

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1. Company profile of Canon

Canon is one of the leading companies in the world for the production of electronic goods. Although known by most of the world's consumers for its cameras, Canon has developed and strengthened, over the decades, several businesses that allow it to be a solid company in continuous technological evolution; these businesses concern the network cameras sector, commercial-use printers, semiconductor lithography equipment and finally OLED panel manufacturing equipment.

1.1 History and current position

Canon's story has its roots in the year 1933 when a young medical gynaecologist Takeshi Mitarai decided to develop, together with the help of some technicians and friends, cameras and to found the Precision Optical Instruments Laboratory in the Roppongi district, Japan. Mitarai's invention, in 1934, was the first 35-mm Japanese camera which immediately proved very competitive with respect to what was considered the world standard, that of the German company Leica; the camera was called "Kwanon". In 1937 Precision Optical Industry, Co., Ltd. is founded.

In 1940 Precision Optical contributed to preventing the spread of tuberculosis thanks to a very important invention also at a medical level: first indirect x-ray camera.

After all these successes Mitarai and his group had to face the considerable difficulties related to the Second World War. During this period, the company barely resisted due to the scarce capital and rationed raw materials.

In 1947, after the conflict ended, the company becomes Canon Camera Co., Inc. 1950 was a year that marked another important step for Canon, in fact the company began to open up to the world market and continued to develop until 1955 when Canon created an US subsidiary. Only two years later the company created a European subsidiary based in Geneva.

The decade between 1960 and 1970 was very prolific for Canon: already in the early years of this decade it established itself as a leading company in the Japanese market for cameras in the middle-price segment, also managing to triple its size. In 1964 Canon began to differentiate its business and this differentiation was the push for innovation also in terms of know-how. In fact, in that year, the company decided to face the challenge of entering the calculator machines sector and introduced the "Canola 130 eletronic calculator" model, the first calculator in the world to use the current ten-key keypad standard. In 1970, together with the industry leader 'Texas Instruments' Canon produced the first all-electronic hand-held calculator, the 'Pocketronic'. In 1965 Canon became an absolute innovator in the copier field, its new plain-paper copier technology supplanted that of Xerox (xerography). This level of such profound diversification led Canon management to change the name again, which simply became Canon inc.

Despite the great technical hurdles and the great innovations made by Canon in these years, right at the end of the 60s, the company began to show a shortage under a certain economic profile, in particular that of marketing. The company, indeed, was not effective enough in realizing strategies that allowed it not to waste its competitive advantages and profits. These errors weighed heavily on the company's economic and financial performances, so much so that in 1975 Canon was unable to pay dividends and it was the first time since the end of the Second World War.

This period of harsh economic and financial imbalance was overcome thanks to the great intuition of its founder and now president Mitarai who decided to entrust the leadership of the company to the CEO Ryuzaburo Kaku. Kaku had an innovative vision of corporate management and decided to give new life to the way the company managed its resources and also to the entire sales management sector. Thanks to Kaku, Canon began to simplify all its operations and to advertise its products in a more effective and aggressive

way, transforming marketing from a weakness to a strength. In 1976 Canon launched one of its most revolutionary cameras, equipped with a microprocessor capable of focusing automatically. Canon thought of an ad hoc advertising campaign, with many passages in the TV commercials whose protagonist was a famous tennis player John Newcombe. Kaku's foresight and the new way in which Canon developed products much faster, allowed the company to exploit its competitive advantages also in the printer and medical sector (Canon's engineers developed a laser for dilating pupils).
In 1977 Kaku was named president of Canon, along with Mitarai who remained in office anyway. Canon continued to launch new products together with important advertising campaigns. The company managed to change its attitude, which went from being passive to proactive and thanks to this, in the 80's Canon surpassed the direct competitor, Nikon, in the sale of cameras.

In 80s, Canon heavily focused on research and development in the field of integrated optical circuits for personal computers of the future. In connection with this project, in 1984, Canon Sales began supplying the Apple Macintosh in Japan. This investment in optical circuits was fully rewarded when Steve Jobs chose Canon chips for his new 'NeXT' computer.

In these decades Canon recorded a huge growth in sales and profits: in the early 1990s sales reached a value of 8.18 billion dollars and the profits reached 232 million dollars. However, the following years saw a slower growth due to the fact that various key markets for the company, such as that of cameras and copiers, were reaching the maturity stage. Despite this slowdown, Canon did not suffer serious losses as in the case of its competitors Nikon and Minolta, who underwent the technological innovation of the transition between reflex and compact cameras. Another factor, which instead affected a lot, was the depreciation of the yen worldwide and this was mainly hard for the Japanese electronics giants voted for export, just like Canon. For this reason, Canon decided to increase its degree of globalization and decentralization, deciding to move the production of some products to other countries such as Mexico for jet printers. Despite this crisis, one of Canon's diamond points was, and still is, its commitment and its investments in research and development which still allows it to be competitive and to maintain important shares in the laser printers, copiers and reflex cameras sectors.

1.2 Organizational structure

In the previous chapter an historical background of the company has been presented and the main strategic choices has been told in order to explain how Canon has reached its current position. In the following section, several aspects of organizational structure will be taken into account. Starting from a quick overview of Canon's ownership composition, it will be later shown the reasons behind the governance mechanisms applied to protect shareholders' interests. After this, the analysis will slide from ownership issues to the corporate strategies chosen by top management. More specifically, next investigations will deal with the criteria according to which Canon groups organizational tasks into roles and subunit to create value and maintain a sustainable competitive advantage.

Canon Inc., its subsidiaries and affiliates form a group of which Canon Inc. is the parent company. As of August 1, 2019, Canon had 256 consolidated subsidiaries and 20 affiliated companies accounted for by the equity method[1].

[1] Cf. Security and Exchange Commission (2019).

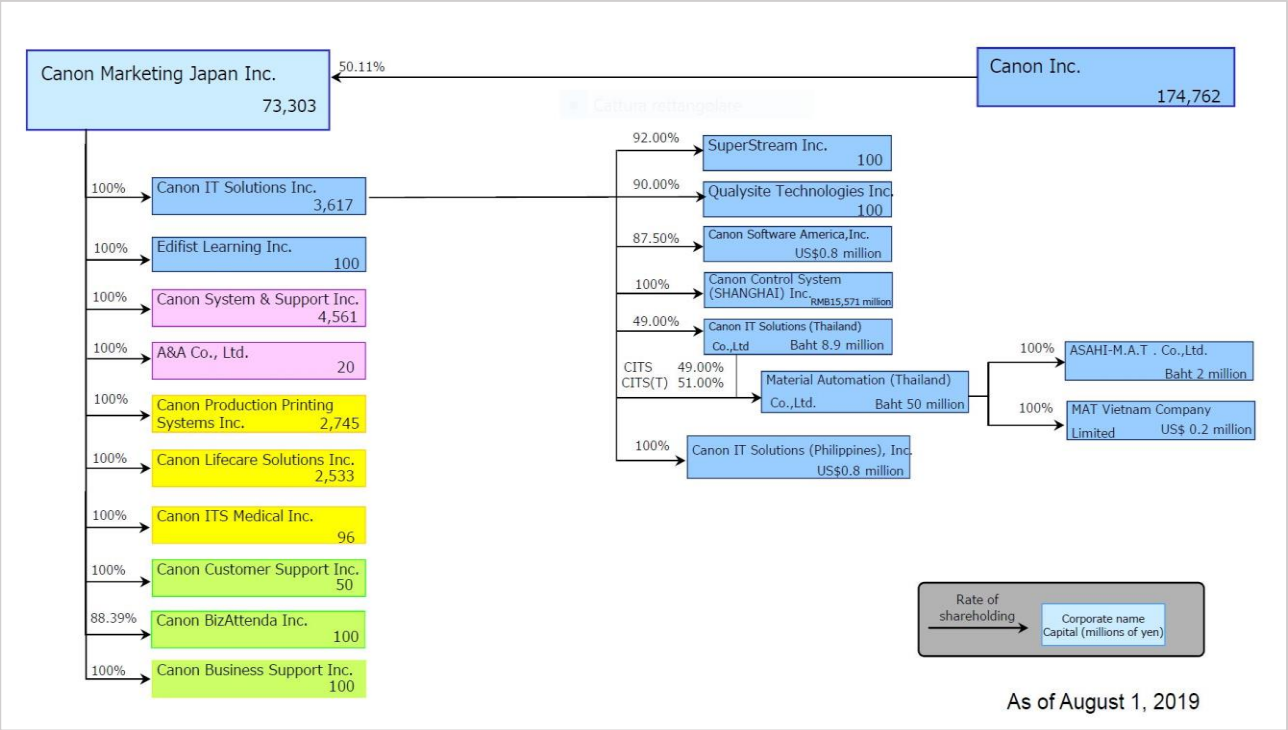


Figure 1: Canon Inc. organizational form

Source: Canon Global website

Looking at the parent company ownership, Canon Inc. presents the peculiarities of public companies: the capital share is spread toward numerous investors who delegate the decision-making power over organizational resources to directors and managers. In *figure 2* a classification according to different categories of shareholders is made. More than half of shares are owned by companies: one-third of the ownership is retained by financial institutions, whose main characteristics will be soon considered, while 19% by foreign companies. Individuals are the second shareholders group (22%), before securities companies (6%). In fact, since treasury stock (20%) refers to shares that are bought back by the company, it can't be considered as a proper typology of owner. In order to provide a clearer comprehension of Canon's ownership, another investigation is carried out. Top ten major shareholders are considered and classified according two criteria: by nationality and by typology (*figure 3*). Nine out of ten shareholders are Japanese and, to the same extent, manage Canon's shares as financial institution.

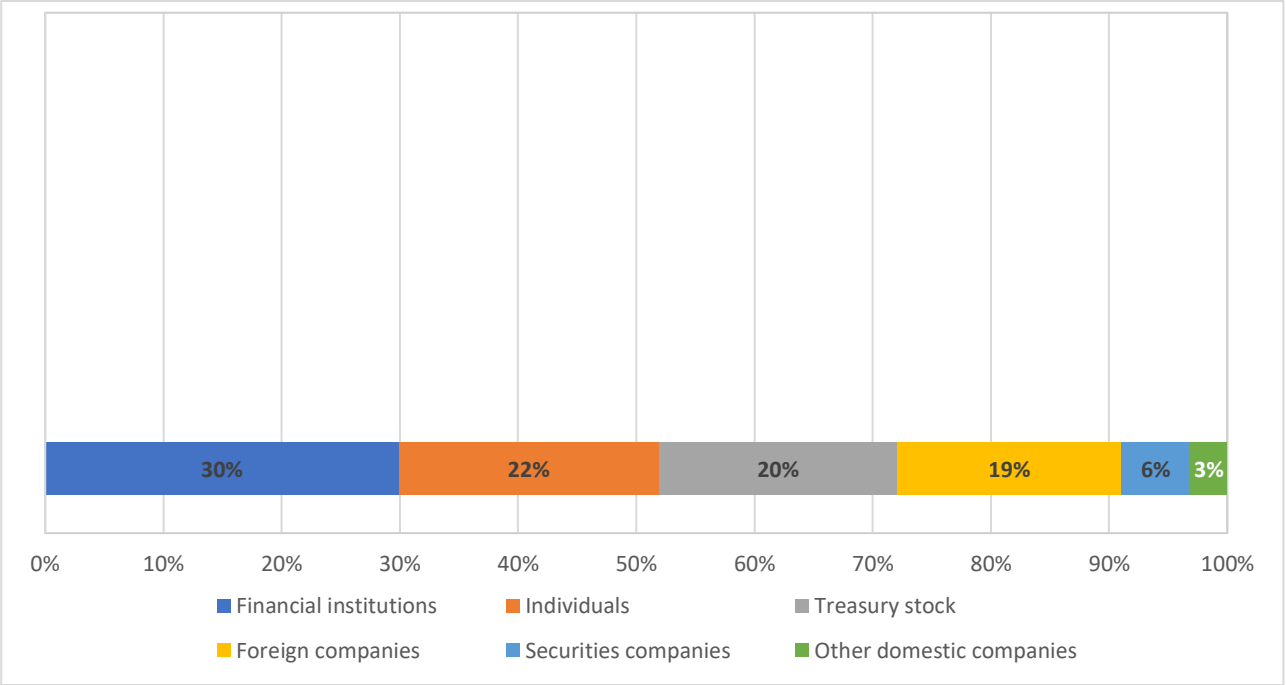


Figure 2: Shareholding ratio by category

Source: own representation based on Canon 2018 annual report

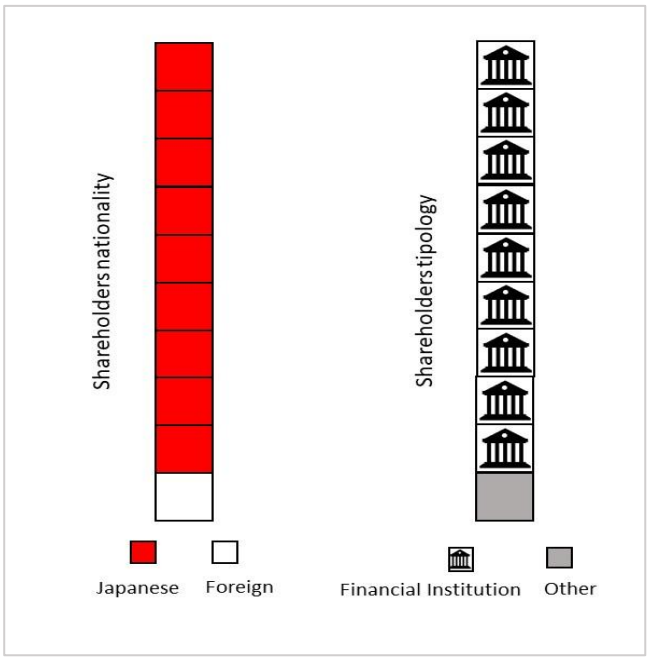


Figure 3: Classification of top ten Canon's shareholders

Source: own representation based on Canon 2018 annual report

After a brief description of main Canon's ownership characteristics, some issues of corporate governance are now described. Since corporate governance is a set of rules aiming to align the shareholders' interests with managers' operations, considerable governance implications from Japanese financial institutions are expected. First, in order to protect the consistent investments of financial institution, a Risk Management Committee is set up. The Committee consists of three entities: the Financial Risk Management Subcommittee, which is reliability of financial reporting; the Compliance Subcommittee, which is tasked with

promoting corporate ethics and improving legal compliance systems; and the Business Risk Management Subcommittee, which is charged with improving systems to manage overall business risks. The Risk Management Committee verifies the risk management system's improvement and implementation and reports the status to the CEO and the Board of Director[2].

Other implications on Canon governance can be found in the composition of the top management group. All positions of director, Audit& Supervisory board member and executive officer are covered by home country nationals, in accordance with the nationality of the biggest investors. This situation actually facilitates the communication between shareholders and directors, who act as trustees, and enforce a profitable relation between the ownership and the management level. Japanese managers cover top hierarchal positions in Canon's subsidiaries around the world too. According to Reiche and Harzing researches, (*Reiche S.B. and Harzing A.W., International assignments, in Harzing A-W, Pinnington A.H. (2015), International Humanr Resources Management, Sage, 4th Edition. Chapter 5.)* multinationals choosing a *parent country national staffing policy* gain some advantages from this strategy. As a result of the presence of managers whose nationality is the same of the HQs of the parent company, an effective communication with home-office personnel is maintained over time; managers have more familiarity with the home office's goals, objectives, polices practice and the transfer of knowledge from HQs to subsidiaries results easier to manage.

Canon's organizational structure can be identified as a product divisional structure due to the criteria applied to group different activities. In fact, products are clustered into separate divisions according to their similarities or differences. For this reason, Canon's manufacturing is spitted in four product lines: office business unit; imaging system business unit; medical system business unit and industry and others business unit. The other main product division structure features concern the use of support functions. Each division is not served by its own support functions but make use a centralized set of support functions, shared together with other divisions. These functions (E.g. Canon Marketing Japan Inc.; Canon customer support Inc.; Canon business support Inc.) operate as independent companies but are actually owned by the parent company by the equity method.

[2] Cf. Corporate Governance in Canon (2019).

1.3 Company's portoflio

Canon has incontestably developed its brand image thanks to the liability and the innovations of its cameras during last decades. Although people generally associate the Canon brand to its oldest business, the manufacture of cameras, the Japanese company has been differentiating its operations in wide-ranging production lines. Canon groups its products into four main divisions according to their similarities or differences: Office business unit; Imaging System business unit; Medical System business unit; Industry and Others business unit. Since a basic understanding of Canon's operations is considered essential for further strategic investigations, a brief explanation of each unit's traditional and new businesses is now provided.

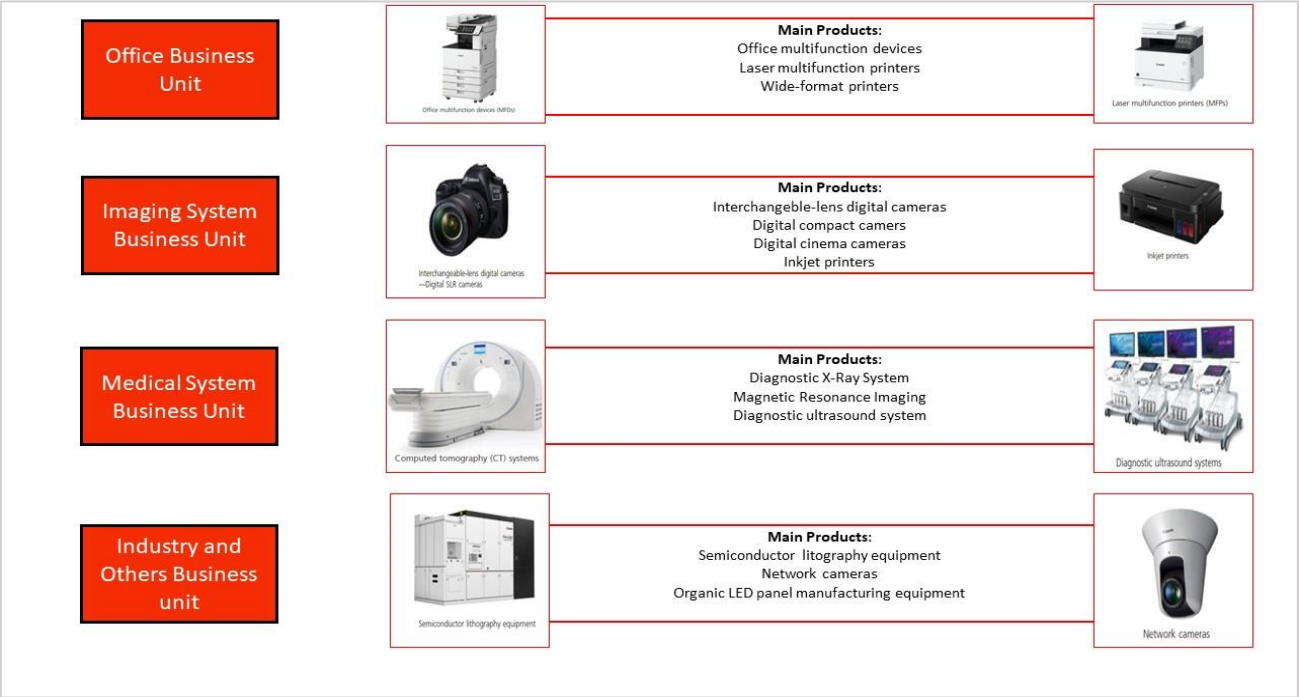


Figure 4: Canon's portfolio divided by divisions

Source: own representation based on Canon 2018 annual report

The Office Business unit provides high-added-value solutions through software and high-quality printing, such as multifunction printing devices and laser printers, with improved network functions[3]. Because of a growing demand every year, this unit is now focusing on the new business of digital commercial printing. In 2010 Canon acquired Océ, a Netherland-based company which is supporting the Japanese group to break into this new business and consolidate its position. The flexibility of digital commercial printings is the main incentive for customers: books, newspapers, magazines and sales promotion materials are printed without the use of printing plates. Consequently, short-run productions and variable data prints are now allowed.

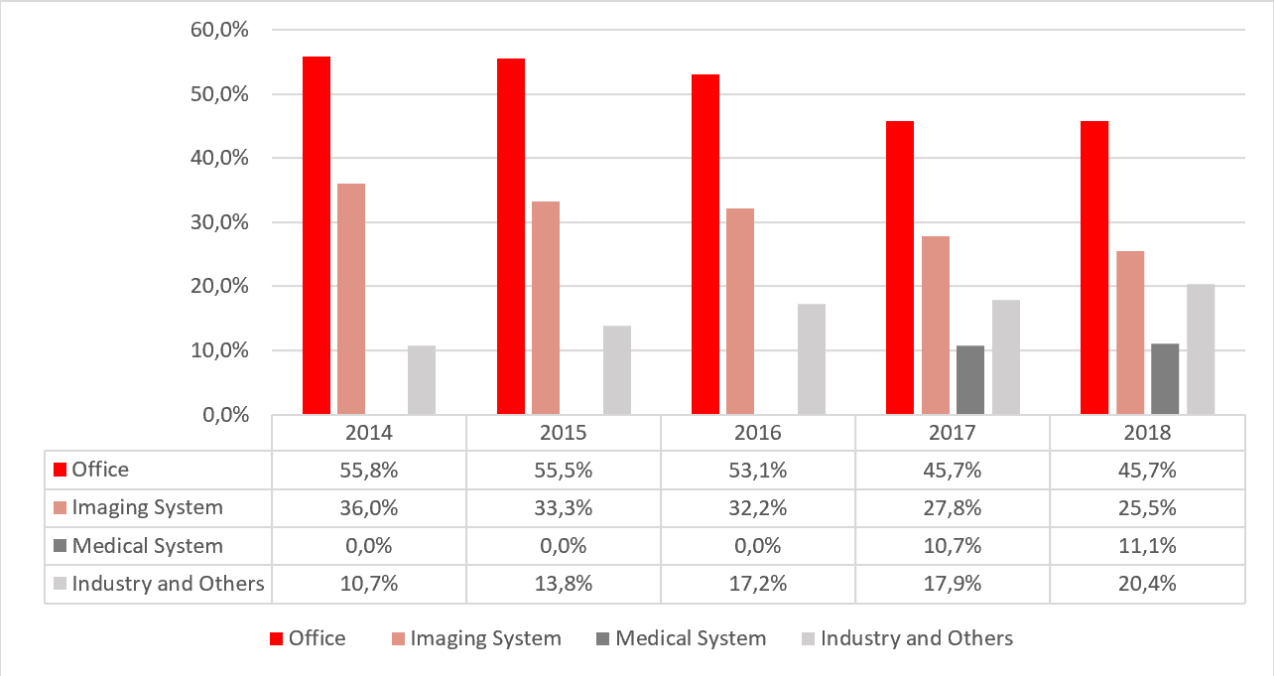
The Imaging System unit produces Canon's most known items both for amateurs and professional photographers, namely digital compact cameras, mirrorless cameras and interchangeable-lens digital cameras. The identification of the brand with this typology of product is due to the fact that is the oldest Canon's business. The supply includes also professional equipment as broadcasting devices and cinema cameras [4].

[3] Canon global website.
[4] Cf. Canon global website.

The Medical system unit offers a broad range of diagnostic imaging equipment such as X-Ray systems, magnetic resonance devices and ultrasound systems[5]. As the entire division was founded in 2016, it has been operating as a new whole business.

The Industry and Others business unit develops semiconductor lithography equipment that plays a role in the especially important production process of semiconductor chips and FPD lithography equipment, which is essential for the production of smartphones, TVs, and OLED displays. Moreover, with the network camera market expanding, Canon has recently created innovative image analysis solutions[6].

Now that a distinction between different subunits and their respective products is operated, an analysis on Canon's sales composition is the next step to understand the weight of each unit on the Group's portfolio. Corporate strategies, which concerns the allocation of organizational resources between different subunits, have presumably been taken after these considerations and will be analysed in the very next chapter. Since 2014 the percentage of products sold by divisions that manufacture more traditional products, as the office unit and the imaging system unit, have been deteriorating: the two category's proportion dropped by almost 10 points. Conversely, medical products and semi-conductor devices are becoming more and more important in Canon's portfolio as demonstrated by the rise of medical system's and industry's shares.



	2014	2015	2016	2017	2018
Office	55,8%	55,5%	53,1%	45,7%	45,7%
Imaging System	36,0%	33,3%	32,2%	27,8%	25,5%
Medical System	0,0%	0,0%	0,0%	10,7%	11,1%
Industry and Others	10,7%	13,8%	17,2%	17,9%	20,4%

Figure 5: composition of sales by business unit

Source: own representation based on Canon 2018 annual report

However, since each business unit embeds both new and old business, another different classification of sales composition was considered necessary (*figure 6*). New business such as digital commercial printing, network cameras, medical systems and industrial equipment have been strengthening their positions as proven by their sales growth in last five years. In the next chapter will be considered Canon's corporate strategies aiming to sustain new business growth and recover all the others.

[5] Cf. Canon global website.
[6] Cf. Canon global website.

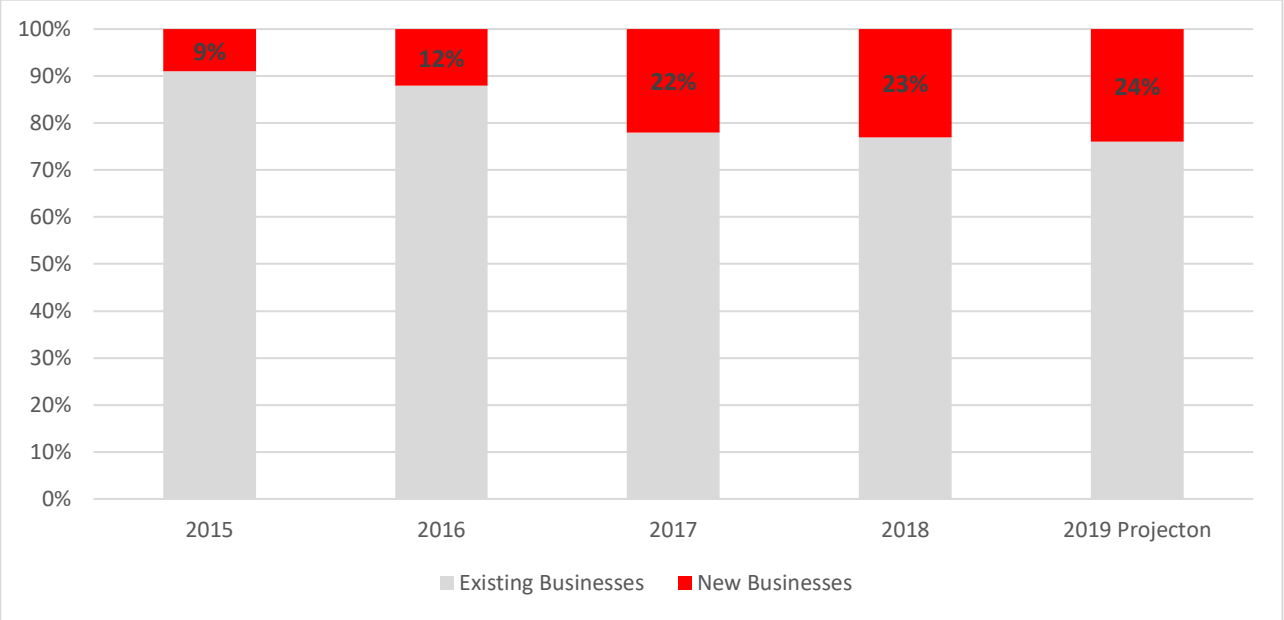


Figure 6: total net sales and new business composition

Source: own elaboration based on Canon Inc. Corporate Strategy conference 2019

1.4 International activities

The Canon group conducts business in more than 220 countries and regions around the world and sells all its products with the Canon brand[7]. In the annual report 4 main strategic areas are considered in order to monitor local sales, evaluate subsidiaries' performances and state future *ad hoc* strategies: Japan; Asia; Europe (including Africa and Middle East too) and the Americas (table 1). As it will be soon observed, these strategic areas are significantly different from each other's, both for the typology of businesses they carry out, and for the innovative contributions provided to the parent company.

STRATEGIC AREA	SHARE OF SALES	N° OF MANUFACTURING SUBSIDIARIES	MANUFACTURING OPERATIONS	N° OF R&D CENTERS	R&D OPERATIONS
JAPAN	22%	25	All businesses	11	Researches concerning all products, especially new businesses like medical devices; quality management technology
ASIA	25,1%	16	Optical lens; digital cameras; copying machines; toner cartidges	3	Imaging processing technologies
EUROPE	25,7%	5	Printers and video solutions	6	Clinical decision support systems; commercial printers; network video solutions
AMERICAS	27,2%	3	Digital cameras; printers and toners	2	Medical devices

Production and research of new businesses
Production and research of traditional businesses

Table 1: location of Canon's manufacturing and R&D facilities

Source: own representation based on Canon 2018 annual report and global.Canon

Japan is the core of manufacturing and R&D operations. In this country is located the highest number of manufacturing centres (25) and research and development facilities (11), besides all the administrative headquarters. The creation of all Canon's products is followed step by step by the development centres, which conduct studies on all company's goods, but are especially focused on new businesses like medical devices. The quality management is kept in high regard too, as demonstrated by a specialized R&D function: "Development of quality management technologies".

Canon has established a presence in Asia in 1970 when opened a manufacturing facility in Taiwan; now it provides the biggest contribute, after the Japanese area, to the overall production with operations in 10 countries and regions including China, Hong Kong, India, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand, and Vietnam[8]. This wide presence of manufacturing facilities is plausibly due to lower cost of labour. Conversely, innovative operations are restricted to only 3 research centres focused on imaging processing technologies. Therefore, no new ideas or capabilities concerning new Canon's businesses are implemented in this strategic area.

Europe is another strategic centre for R&D, particularly for new devices. After the acquisition of the Dutch Company Océ that is giving a tremendous support in the commercial printing in Europe and the Americas, Canon is gaining huge benefits from the Océ-Technologies B.V. specialised in R&D of large format commercial

[7] Cf. Canon global website
[8] Cf. Asia.Canon

printers, medium and high speed printers for office use and consumables[9]. All other R&D facilities are improving technologies associated with new business such as clinical support decision systems and network video solutions. On the manufacturing hand, the production is mainly related with printers and video solutions. Even if the European area is not the biggest market for sales, in 2018 Canon made efforts to enforce its customer-centric approach in Europe by opening two Customer Experience Centres in Switzerland and France. Through this new channel customers are expected to receive new opportunities to interact with Canon people, products and solutions [10].

The Americas is the strategic area showing the highest number of sales. Despite this, the production is limited to only 3 manufacturing facilities. The two R&D centres which are located in Illinois and Massachusetts, are both specialised in medical devices.

In conclusion, even though most of manufacturing and R&D facilities are retained in the home country, delocalization is required for both activities. Indeed, a global customer demand can be satisfied only by several production facilities located around the world which reduce transportation costs and time. However, as *table 1* shows, the manufacture of new products is almost completely located in Japan. This corporate choice suggests that Canon prefers developing new capabilities and manufacturing skills in house before exporting these techniques to foreign subsidiaries. On the other hand, competitive forces affecting the industries Canon is operating in, constrain the company to constantly create innovations. Several R&D operations are carried on abroad: researches dealing with new products are conducted not only in Japan, but also in other advanced countries in Europe and US.

1.5 Corporate strategy

Corporate strategy is hierarchically the highest strategic plan set by top management: main decisions concerns issues such as which activities the company have to undertake or which new market is profitable to break into. However, these strategic choices must be conformed to the organizational philosophy which states the main guiding principles of the company. For this reason, before analysing main Canon's corporate plans, a step back will be done by focusing on Canon's philosophy. It is defined by one Japanese word: *Kyosei*. It conveys the company dedications to seeing all people, regardless of culture, customs, language or race, harmoniously living and working together in happiness into the future[11]. Hence, according to this principle, Canon HQs delegate local managers to foster good relations with customers and communities, as well as with governments, regions and the environment as part of their fulfilment of social responsibilities.

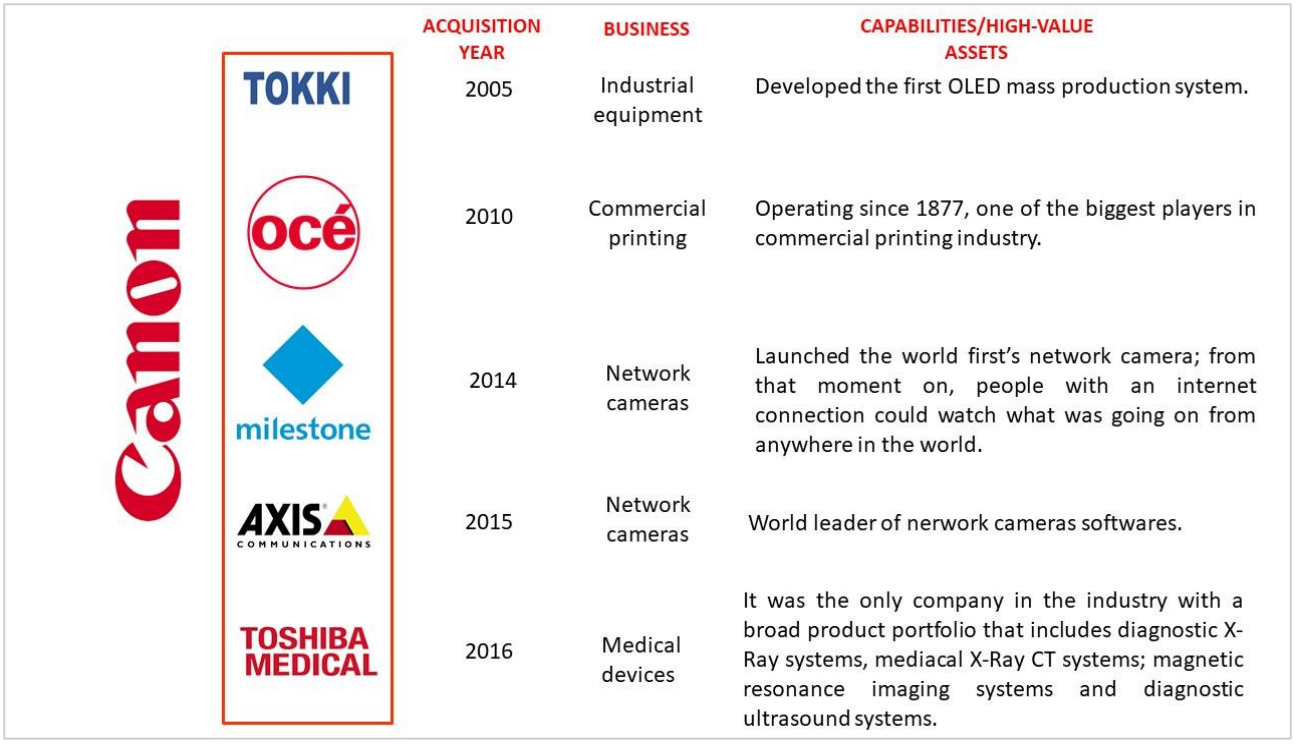
A clear summary of Canon's corporate strategy is stated by the Chairman and CEO Fujio Mitarai:

> "In our five-year medium-to-long-term Excellent Global Corporation Plan Phase V, beginning in 2016 and designed to achieve new growth, we have undertaken a grand strategic transformation of *shifting our core businesses from B2C to B2B*. In 2018, employing such methods as M&A in our four new businesses we successfully completed this transformation of our business portfolio[12]."

The gradually evolution of Canon's organizational domain from business customers to private customers is reflected by the data of the previous chapter: new activities concerning commercial printing, network cameras, medical devices and industrial equipment are becoming more and more important in terms of sales in Canon's portfolio. Looking at Fujio Mitarai's speech, the development of these new four businesses has been carried out in two main steps. First, since an internal development of new specific competences would have been less effective than a direct acquisition from the market, Canon has taken over organizations with

[9] Cf. Canon global website
[10] Cf. Canon annual report (2018)
[11] Cf. Canon global website
[12] Cf. Interview to Canon CEO Fujio Mitarai published on Canon Global website.

high-value assets or long business experience of the market (*figure 7*). Next, Canon's innovative philosophy has been brought into new subsidiaries in order to implement operative practices and align employees' behaviours to the group vision.



	ACQUISITION YEAR	BUSINESS	CAPABILITIES/HIGH-VALUE ASSETS
TOKKI	2005	Industrial equipment	Developed the first OLED mass production system.
océ	2010	Commercial printing	Operating since 1877, one of the biggest players in commercial printing industry.
milestone	2014	Network cameras	Launched the world first's network camera; from that moment on, people with an internet connection could watch what was going on from anywhere in the world.
AXIS COMMUNICATIONS	2015	Network cameras	World leader of nerwork cameras softwares.
TOSHIBA MEDICAL	2016	Medical devices	It was the only company in the industry with a broad product portfolio that includes diagnostic X-Ray systems, mediacal X-Ray CT systems; magnetic resonance imaging systems and diagnostic ultrasound systems.

Figure 7: last Canon's strategic acquisitions

Source: own representation based on Canon Inc. Corporate Strategy conference 2019

1.6 Business model

The business model of a company is a very useful, fundamental tool for having a strategic overall view of company. This overview allows to identify three characteristics which are the basis of the aforementioned business model and are identified in:

- How firm creates value for customers
- How it captures value (revenues streams)
- How interacts with other actors (suppliers, customers, competitors).

In economics, when referring to the matter of the business model, we speak of Canvas which is not properly a theorized model but is a visual tool, a scheme, which visually and effectively shows the functioning of a company in accordance with the three features mentioned.

The Business model Canvas is a set of nine blocks that represent capacity of a company about:

- Value creation:
    1. key activities
    2. value proposition (offer)
    3. customer relationships
    4. customers (intended as the consumer segment)
    5. distribution channels

- Value capture:

6. Revenue
7. costs

- Value network:
  8. key partners
  9. key resources

An analysis of the business model allows us to grasp its strengths and weaknesses and is useful to understand which are the points of potential innovation to be implemented.

Key activities

Canon's main activities, as already explained in the previous paragraphs, are numerous and consist in the production of multifunctional optics, cameras, printers, copiers, scanners and equipment for the medical sector.

These devices are not only intended for the final consumer, therefore for domestic use, but rather they are equipment used in the industrial sector; for these cases Canon is used to provide maintenance services to the companies to which it sells these machines.

Another key activity for Canon is managing the vast network of authorized dealers and accredited service centres. These intermediaries, who sell the company's products and provide assistance with technical failures or problems of various kinds, are all supported by Canon which provides these intermediaries with support and outsourcing services and systems. In addition, Canon pays particular attention to supply chain management which coordinates development, production, sales and after-sales service, ensuring that products are delivered worldwide in time"[13].

Value proposition

Innovation, as we have already learned from the company's history, has always been the driving force for Canon and continues to be so today. The company, in fact, intends to constantly seek innovative products and tools that can support the activities of its customers, products that can meet their needs by accompanying them with technical assistance services. The greatest value that Canon tries to offer to its customers, which is intrinsic to continuous research, is to guarantee the production of reliable products, also counting on the reputation of a strong and historic brand. Ever increasing attention is paid to the green topic and that of environmental sustainability.

Customer relationships

Canon uses many distribution channels and the relationship with customers is important strategic point. Depending on the channel chosen by the customers, the degree of relationship that is established is a little different. Consumers who choose to purchase Canon products independently through the official online store are provided with sources of support through the website including self-help guides, service and repair assistance, manuals, and online technical assistance. On the other hand, customers who purchase from the vast network of official dealers, can enjoy a service that is obviously more direct and more targeted to specific needs: customers can receive more detailed information on products and can receive advice; the level of personal customer care is dedicated, as there is a personal interaction between the two actors.

Large business clients, instead, have direct contacts with the company's sales and marketing department.

[13] Cf. Canon global website.

All types of customers have the opportunity to communicate and get in touch with Canon representatives and operators, through the company's various social media accounts such as Facebook, LinkedIn, YouTube and Instagram.

Customers

Canon's main customers are retail and distribution companies (including small and medium sized firms), professional print organizations, large commercial enterprises, government bodies and consumers. More specifically, we can assert that Canon's market segments are end users, industry, journalists, professional photographers and video makers. Canon also serves the government industries, the TV sector and the medical sector too.

Channels

Canon can count on a vast network of distribution channels (direct distribution) in which the company does not have any intermediary as it uses its own sales points; and also indirectly through retailers. In addition to having physical stores, the company has implemented and enhanced the online distribution and sales channel. Furthermore, Canon is increasingly interested in organizing global events, which become strategic events in terms of distribution.

Revenue

Canon's main revenue stream is its domestic and international manufacture and sale of optical, imaging and multi-functional office equipment products, including digital cameras, digital copiers, laser printers, semiconductor lithography equipment and FPD lithography equipment, flash units, scanners, camcorders and computers. Together with its products, Canon sells assistance and maintenance services for which it establishes an initial fee and then an annual incremental payment depending on the use. The other business services it provides, such as outsourcing, printing services and printing and communication services, also contribute to the revenue stream.

Cost structure

The main costs of Canon are generated by the research and development activities and, obviously, by manufacturing. Moreover, the cost structure is particularly charged by logistics activities and by the legal costs which are required to harmonize contracts and international agreements. Other sources of cost are represented by employee compensation and investments in advertising, which has always been a key element for the company.

Key partners

Canon's main partners are small and medium-sized enterprises which act as resellers for companies and also local operators. Furthermore, in addition to resellers, the Canon channel partners are authorized to give technical support and provide all the services that Canon offers for all types of product of the company.

Key resources

The main assets that Canon can count on are undoubtedly its products, its people and its manufacturing facilities. Then, the most strategically relevant resource for society are the patents on proprietary technologies. In 2015 Canon was ranked third in a list of top US patent holders.

2. Business analysis and competitive positioning

Canon Inc. is a product divisional structure operating in different electronic industries. Because of the wide heterogeneity of Canon's items, a specific analysis of each product and industry would be necessary. However, since an in-depth study of each market would take an excessively long digression, the following section will offer a breakdown of 4 production lines. One typology of product has been chosen for each business unit (Office, Imaging System, Medical, Industry and Others), two of these concerns new business, while the other two are considered traditional business by Canon. This pattern is expected to be a proxy of all Canon's operations and industries in which it is competing. The study of digital camera industry will have a huge weight in the whole analysis for two reasons: Canon brand is undoubtedly associated with this product worldwide; second, the market trend has completely changed in last ten years and had significant implications on organizations' corporate strategies.

2.1 Digital camera industry analysis

The digital camera industry, with a size of almost 7 billion dollars, embodies a wide range of products with different prices, users and technologies. Compact cameras are an inexpensive entry-level camera for the amateur digital photographer and are characterized by an in-built lens. Digital single lens reflex (DSLR) are for serious amateurs and professionals alike; are larger, heavier than compact cameras and have interchangeable lenses. Finally, mirrorless cameras offer most of the features of a DSLR camera, but they are smaller, lighter, and generally less expensive.

The data presented by CIPA, the association of Japanese digital camera producers, show a dramatic downward trend in last ten years (*figure 8*): from 2010 to 2013 shipments were halved. This negative trend expanded during these years, and, as a result, sales plummeted from 120 million (2010) to 15 million (2019). The negative growth rate of the whole last decade is a proof of this downward trend: the worst year for digital camera sales was 2013 when shipments hit a low of -36%; only in 2017 data shows a weak recovery but they soon deteriorated in the following years.

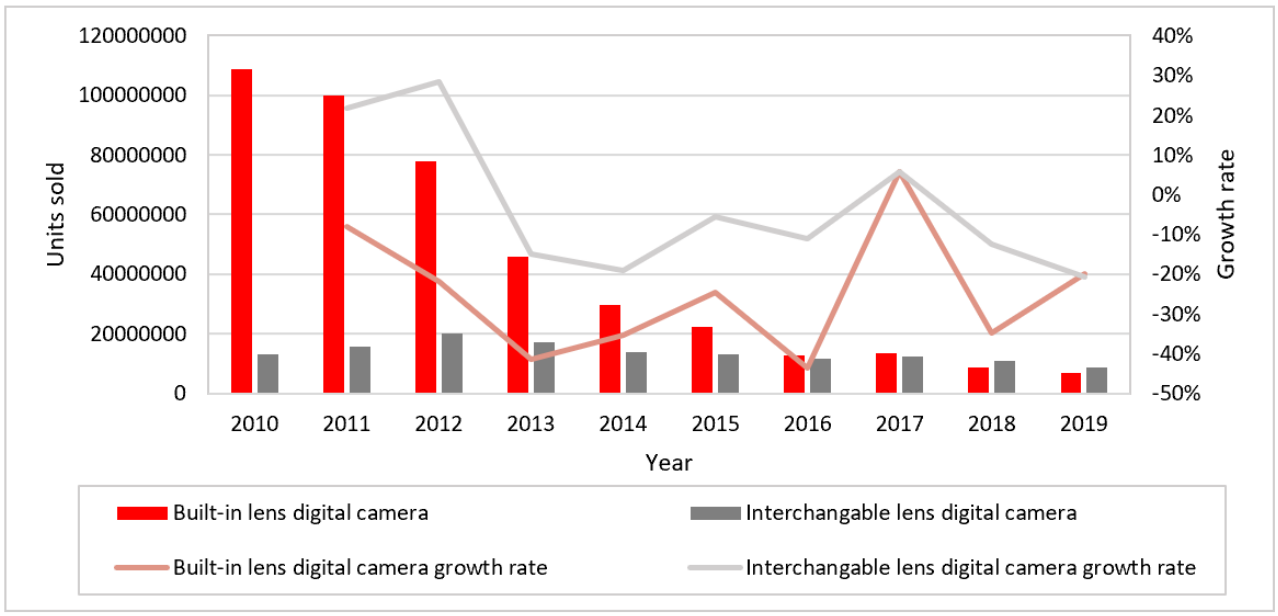


Figure 8: Growth of built-in lens digital camera and interchangeable lens digital camera from 2010 to 2019

Source: own representation based on CIPA 2019 report

The main reason of this decay can be explained by tremendous improvements in a specific category of substitute goods: smartphone cameras. Looking at the past 5 years of smartphone camera development, it

can be said that camera hardware and image processing are evolving alongside each other and at a much faster pace than in the "traditional" camera sector[14]. In fact, several different software and hardware strategies have been introduced for improvements in areas such as exposure, stabilization (optical stabilization), autofocus (more AF sensors) and zoom (dual camera).

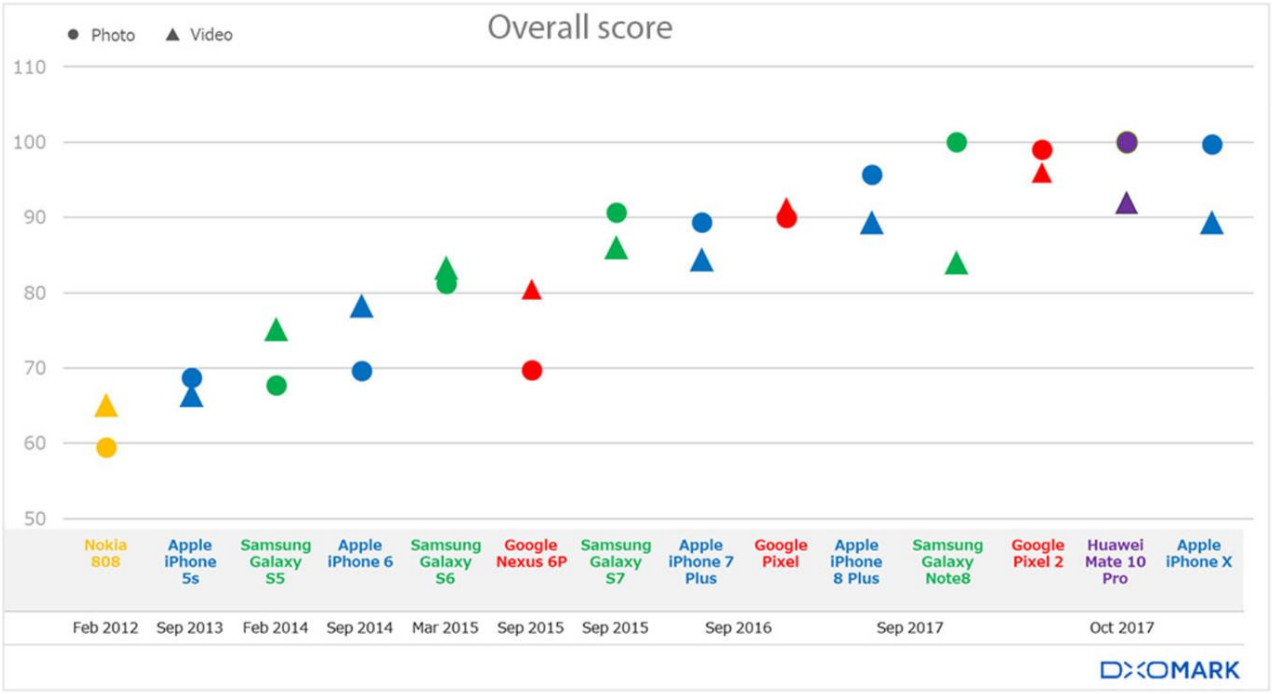


Figure 9: improvements of smartphones cameras from 2012 to 2017

Source: Lars Rehm "Disruptive technologies in mobile imaging: Taking smartphone cameras to the next level

Other conclusions can be made by considering interchangeable lens digital camera (DSLR and mirrorless), which are generally bought by professionals and photography lovers. In comparison with built-in lens digital cameras, these kinds of product suffered a smaller decrease (-34% from 2009 to 2019) and upward trends were founded. *Figure 8* shows that the growth rate of interchangeable lens digital camera has always been greater than the one of built-in lens digital camera. Moreover, during 2011, 2012 and 2017 shipments expanded.

In conclusion, there are two potential causes of the decline of digital camera market: innovation in substitute goods, such as smartphones, and the evolution of the industry from a mass market to a niche market. The composition of sales of digital cameras has completely changed during last decade (*figure 10*). Now days, more than half of digital cameras sold have interchangeable lenses and are generally bought by professionals because of the high price and the deep knowhow concerning the appropriate use of the device. All other people usually prefer buying a smartphone which simultaneously grant multifunctionality and a satisfactory quality of the photo. A similar analysis was given by Canon CEO Fujio Mitarai: "People usually shoot with smartphones. The digital camera market will keep falling for about two years, but professional and advanced amateurs use about 5 to 6 million units. Finally, the market will hit the bottom. The digital camera market has been in decline for some time, but it was hoped that the release of full-frame mirrorless cameras would reinvigorate things. Unfortunately, mirrorless cameras are simply replacing DSLRs, they aren't resulting in new camera adopters."[15]

[14] Cf. Disruptive technologies in mobile imaging: taking smartphone cameras to the next level.
[15] Cf. Fujio Mitarai interview with Nikkei.

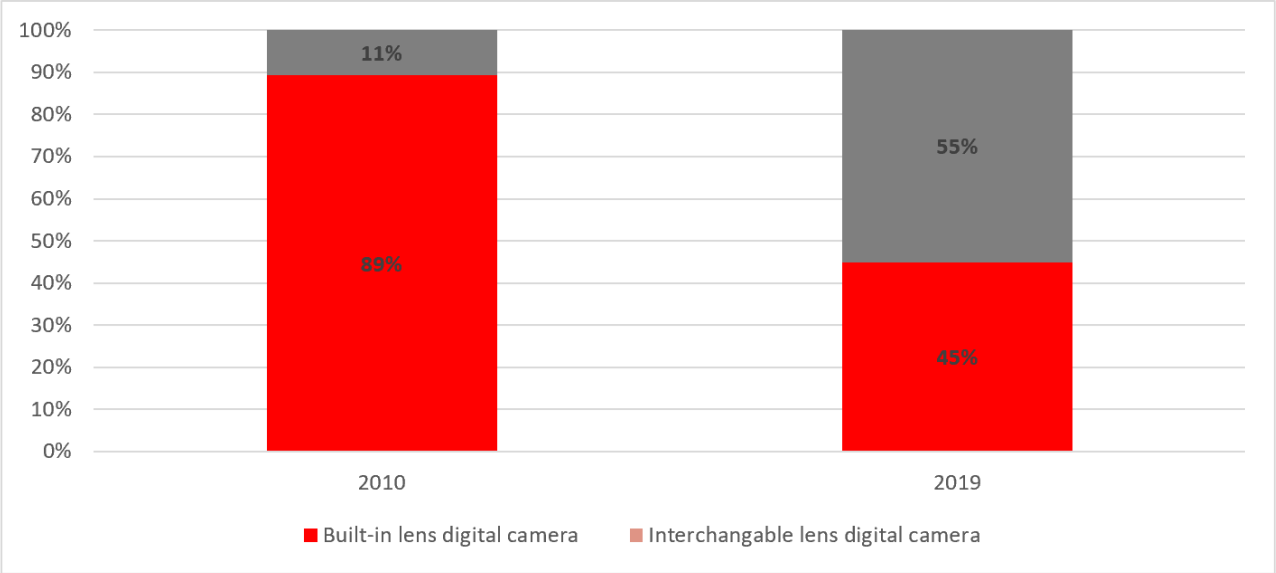


Figure 10: composition of sales (units sold) of digital cameras by typology in 2010 and 2019

Source: own representation based on CIPA 2019 report

2.1.1 Market share and market penetration

In *figure 11* are presented the five biggest companies operating in digital camera industry. They are all Japanese and cover 85,2% of total market by units sold. The data have been taken from the last annual report of each brand; in particular, net sales (billion yen) are considered rather than units sold in order to take into account price differences. Canon is the leader of the market and has a really consolidated position for two main reasons. First, its net sales (1008 billion of yen) are three times more than the first competitor which is Sony. Secondly, Canon shows a clear advantage over Nikon (361 billion of yen), which can be considered its main competitor because they both mainly supply high-value cameras such as DSLRs and mirrorless. Fujifilm cover the third position with 387 billion yen of net sales, while Olympus seems to be very distant from its competitors with only 60 billion. The "Others" includes non-Japanese companies that have lower net sales than previous brands. Three of them are European (Hasselblad, Leica and Rollei), BenQ is set in China, GE and Kodak are both Americans while Samsung comes from Korea.

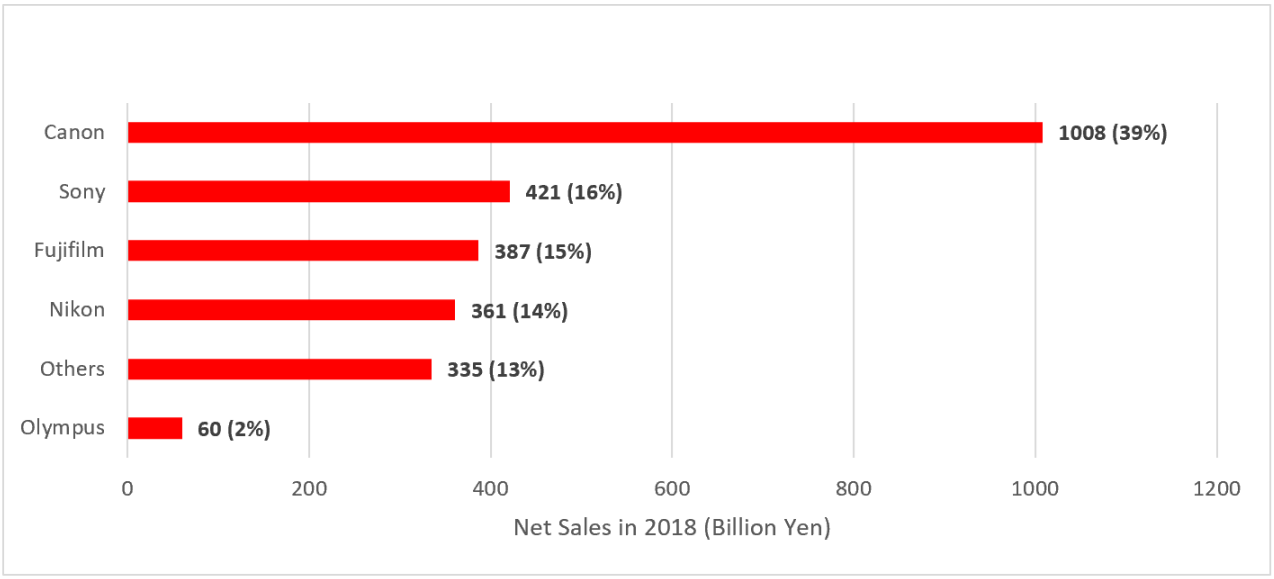


Figure 11: market shares of leading companies in digital camera industry (net sales)

Source: own representation based on companies' 2018 annual report

During the last five years no important changes regarding the ranking of the biggest players have been observed. However, in 2017 Fujifilm became the third most important company for net sails operating in digital camera industry at the expense of Nikon. Looking at these companies' annual report, it has been found that Nikon suffered the consequences of Kumamoto earthquake on the supply chain that caused a decrease in the number of units sold. On the other hand, Fujifilm achieved a great performance in terms of net sales due to strong sales of instant photo systems and FUJIFILM GFX 50S, a medium format mirrorless digital camera equipped with a large sized sensor[16].

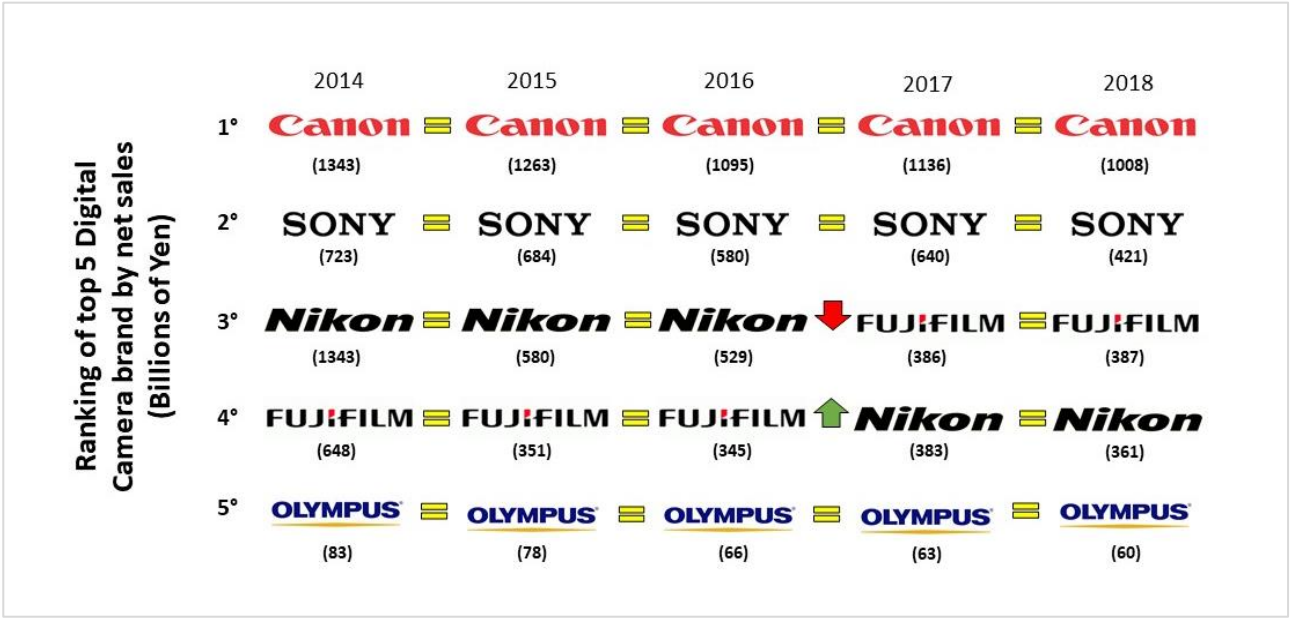


Figure 12: ranking of top 5 players in digital camera industry

Source: own representation based on companies' annual report (2014- 2018)

In order to provide more complete information about digital camera industry, the market penetration is now considered. This kind of analysis makes a step forward to understand how Canon is performing in comparison with its rivals and if this company is stronger than market trends. To evaluate the market penetration the growth rate of Canon's net sales is compared with the industry's one.

[16] Cf. Fujifilm annual report (2017).

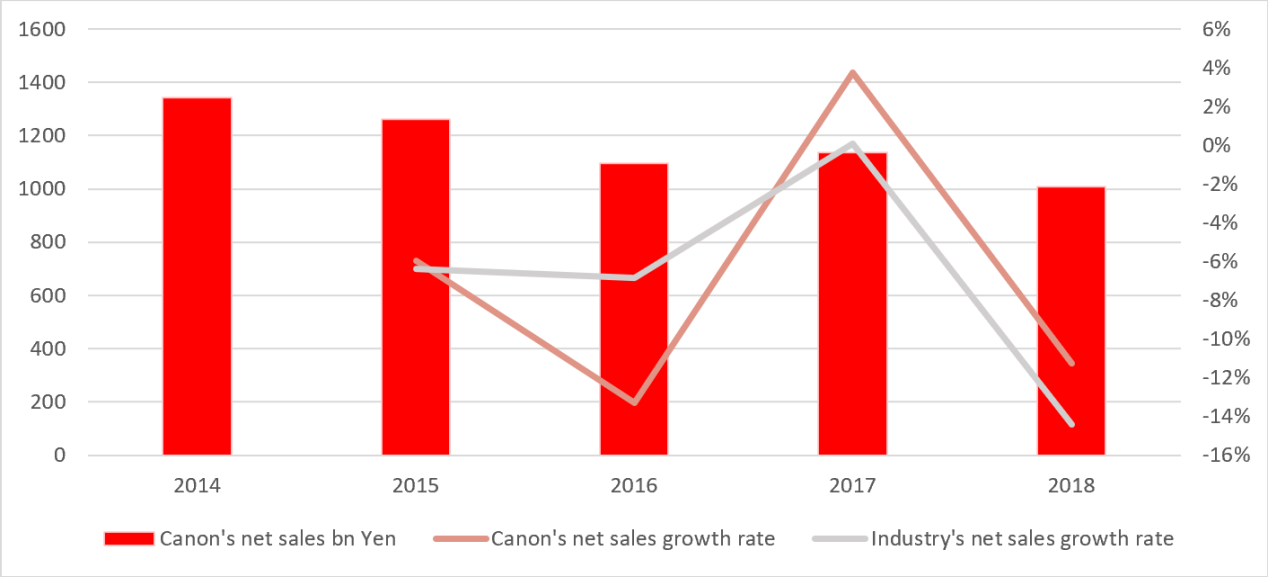


Figure 13: Canon's net sales in billions yen and net sales growth rate of Canon and overall digital camera industry in %

Source: own representation based on Canon annual reports (2014- 2018)

Overall, Canon's performance has followed the upward/downward market trends. Reflecting the contraction of the market, net sales declined in year-on-year terms, though Canon maintained its leading market share in key countries in Europe and the Americas, as well as in Japan and China[17]. Significant differences between Canon's net sales growth rate and digital camera market's growth rate were found in 2016 and 2017. In a first step, Canon achieved worse performance than average results, than it gained higher net sales. In 2016, along with the ongoing contraction of the market, sales volume declined due to difficulties in procuring components because of the earthquake in Kumamoto earlier in that year. This outside factor deeply influenced the profitability generated by sales of high-added-value models that deliver high image quality and zoom capabilities[18]. In 2017, while the pace of decline in demand for interchangeable-lens digital cameras is gradually decelerating, the sales of the advanced-amateur- models enjoyed solid demand, allowing Canon to maintain the top share, mainly in the United States, Europe, and Japan[19].

2.1.2 Concentration analysis

The concentration analysis of digital camera market is carried out by making use of two different tools: the concentration ratio (CR) and the Herfindahl-Hirschmann Index (HHI). Even though it could not be possible to expand the analysis with data series because of the lack of information, further investigations are made on different digital camera's segments. The concentration ratio is calculated as the sum of the market share percentage held by the largest specified number of firms in an industry; in this situation, the three and five biggest companies by units sold are considered (CR3/CR5). The concentration ratio ranges from 0% to 100%, and an industry's concentration ratio indicates the degree of competition in the industry. A concentration ratio that ranges from 0% to 50% may indicate that the industry is perfectly competitive and is considered a low concentration. Oligopoly exists when the top five firms in the market account for more than 60% of total market sales. If the concentration ratio of one company is equal to 100%, this indicates that the industry is a monopoly[20].

[17] Cf. Canon sustainability report (2019).
[18] Cf. Canon annual report (2016).
[19] Cf. Canon annual report (2017).
[20] Cf. Investopedia.

CR5 Digital Camera market			
CR5 2017		CR5 2018	
83,1%		85,2%	
CR3 Interchangeable-lens camera market		**CR3 Compact-fixed lens- camera market**	
CR3 2017	CR3 2018	CR3 2017	CR3 2018
81,1%	87,2%	72,1%	89,1%
CR3 Mirrorless camera market			
C3 2017	CR3 2018		
n.a.	79,8%		

Table 2: market concentration by type of digital camera

Source: own representation based on CIPA reports (2017-2018)

Looking at *table 2*, it can be said that Canon is operating in an oligopoly due to the high level of CR5. Elevated levels of concentration are found in more specific segments too, so this environmental feature is typical of the competitive environments in which firms are operating. The CR value has increased during the last year, it means that the digital camera market is more and more retained by few big companies. The HHI, which is calculated by adding up the squares of market shares of all the companies, shows a similar result to the concentration ratio. Indeed, accordingly to the parameters of *table 3*, HHI= 0,24 implies a very concentrated sector in which competition is low and the profit is split between few companies.

HHI VALUE	INTERPRETATION	
HHI < 0,01	Very fragmented sector	
0,01 < HHI < 0,1	Low concentrated sector	
0,1 < HHI < 0,18	Moderately concentrated sector	
HHI > 0,18	Highly concentrated sector	HH of digital camera market = 0,24

Table 3: digital camera market concentration, HHI index

Source: own representation based on 2019 CIPA report

In conclusion, the implementation of these two tools demonstrates that the digital camera market is highly concentrated and this feature can be found in associated market segments too. As Canon is operating in an oligopolistic market, high barriers to entry are expected to obstacle new companies that want to break into the digital camera market. These barriers are mainly structural rather than strategic and includes high research and development costs; high set-up costs; ownership of key resources (e.g. patents) and economies of scale.

2.2 Multifunction device industry analysis

Multifunction Devices (MFDs) is an office machine which incorporates the functionality of multiple devices in one and perform multiple office imaging tasks, such as input, output, storage, and transmission of documents. So, a MFD essentially acts as a combination of fax, photocopier, printer and scanner. The market size of this product is becoming more and mor important in the IOT era because of the necessity to provide a centralized document distribution, production and management system in a large office setting. In 2018

the units sold were 4,2 billion dollars and rose by 2,4% compared to the previous year[21]. Multifunction devices are embedded in the Office Business Unit of Canon and, together with commercial printers, are the products on which the division has invested more in latest years. The multifunction device industry, similarly to the camera industry, is very concentrated: the CR5 indicator shows that the biggest companies control almost 75% of all market. Together with this, the nationality of all main competitors is Japanese. Since Canon is the third most successful company by units sold (16,6%), it can be said that it performs a key role in this industry. However, accordingly to the market shares, Canon has not a competitive advantage over its rivals which own very similar shares.

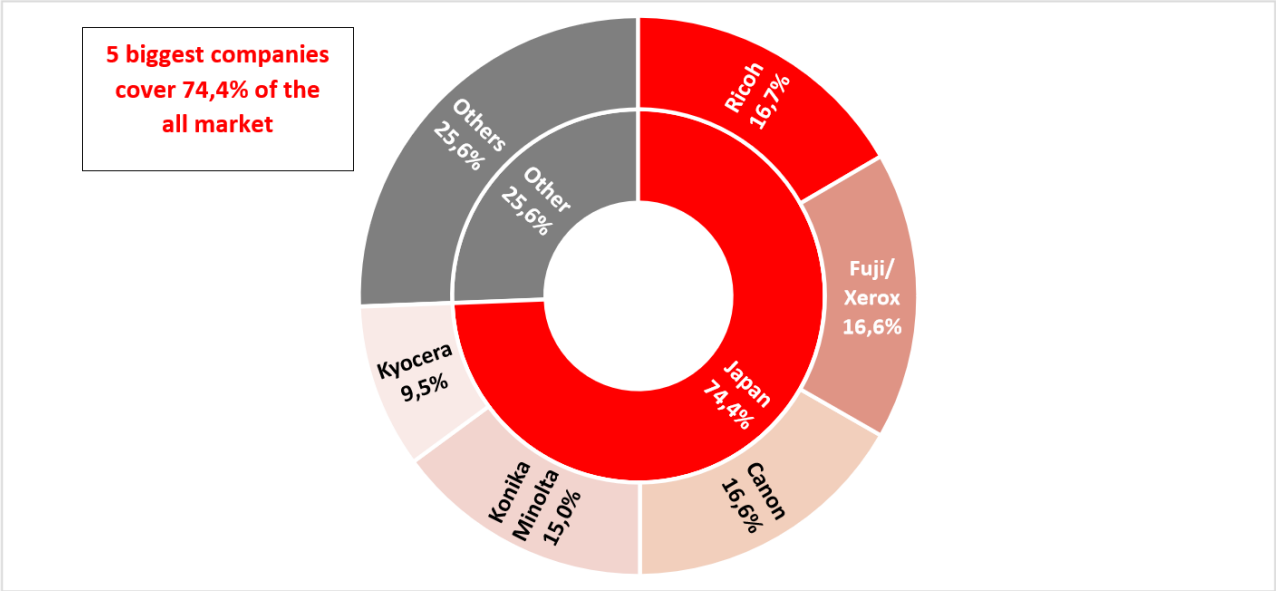


Figure 14: multifunction device market shares by sales ($)

Source: own representation based on Nikkei v.data

2.3 Medical device industry analysis

The Medical System Business Unit of Canon provides several diagnostic imaging equipment, from computed tomography systems to radiography equipment that support medical decisions [22]. Because of the increasing demand for medical care in a wide range of healthcare fields (health promotion, disease prevention, examination and diagnosis treatment), the market is gradually increasing: in 2018 sales grew by 5% and reached a value of 41,2 billion dollar[23]. Canon face a similar market structure to those previously analysed due to the high level of concentration (CR5= 80,4%). Although, conversely from the digital camera and multifunction device industry, the biggest companies have not Japanese origins. Once again Canon meets the competition of Fujifilm, which both manufacture digital cameras and medical devices and, together with Canon, cover the highest positions in these industries.

[21] Cf. Nikkei website.
[22] Cf. Canon 2019 sustainability report.
[23] Cf. British Evaluate.

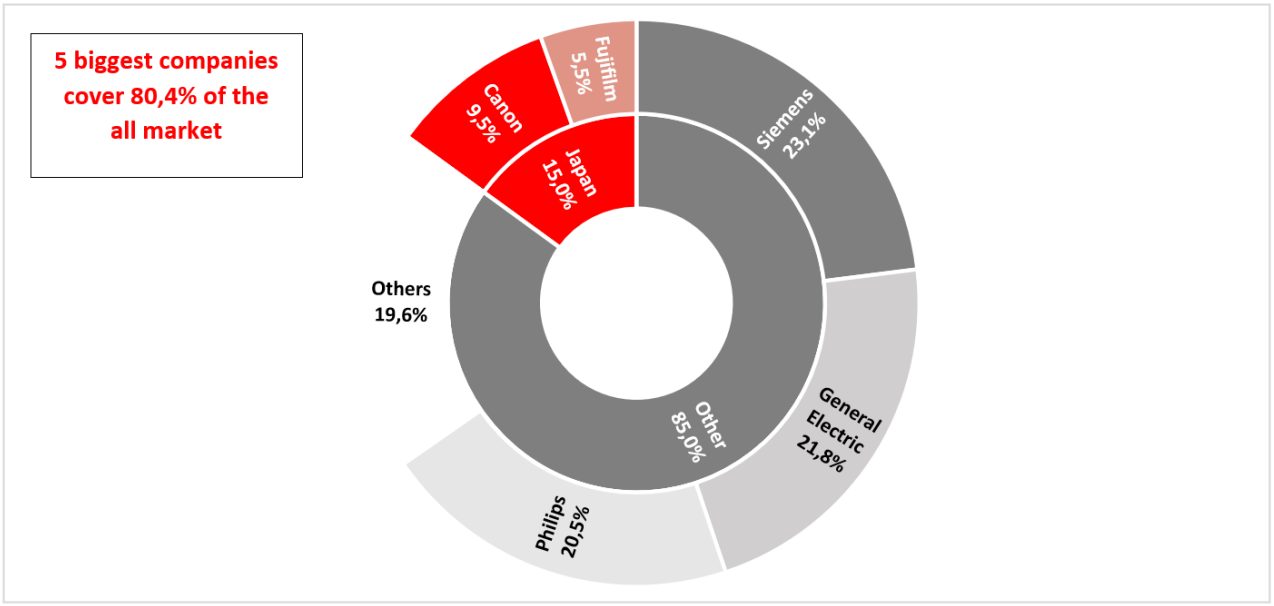


Figure 15: medical device market shares by sales ($)

Source: own representation based on Nikkei v.data

2.4 Network camera industry analysis

The industry and Others Business Unit of the Canon group is enforcing its market position in the production of network cameras. Network cameras aims to offer an intelligent security system and to track the events in many industrial, commercial and crowded places. Many network camera suppliers bundle hardware systems with data backup solutions and image processing technology that enforce the capability to prevent and record crimes. Until this moment, Canon has not reached a top position in this industry yet. However, the Japanese company has announced the purpose of improving its condition by a takeover corporate strategy: Axis, the third biggest player of the industry, and Milestone, leader in video management systems, will be the first next acquisition of Canon Inc[24]. The market structure presents several differences from those seen before. First, the network camera industry is fragmented as proven by the low level of the CR5= 50,2% and not controlled by Japanese companies. Furthermore, the low level of market concentration suggests a fierce competition between numerous companies which entered the market due to its quick growth in latest years. In 2018 the market size reached a value of 93,16 billion units sold after an outstanding growth of 29,2%[25].

[24] Cf. Canon global website.
[25] Cf. Nikkei website.

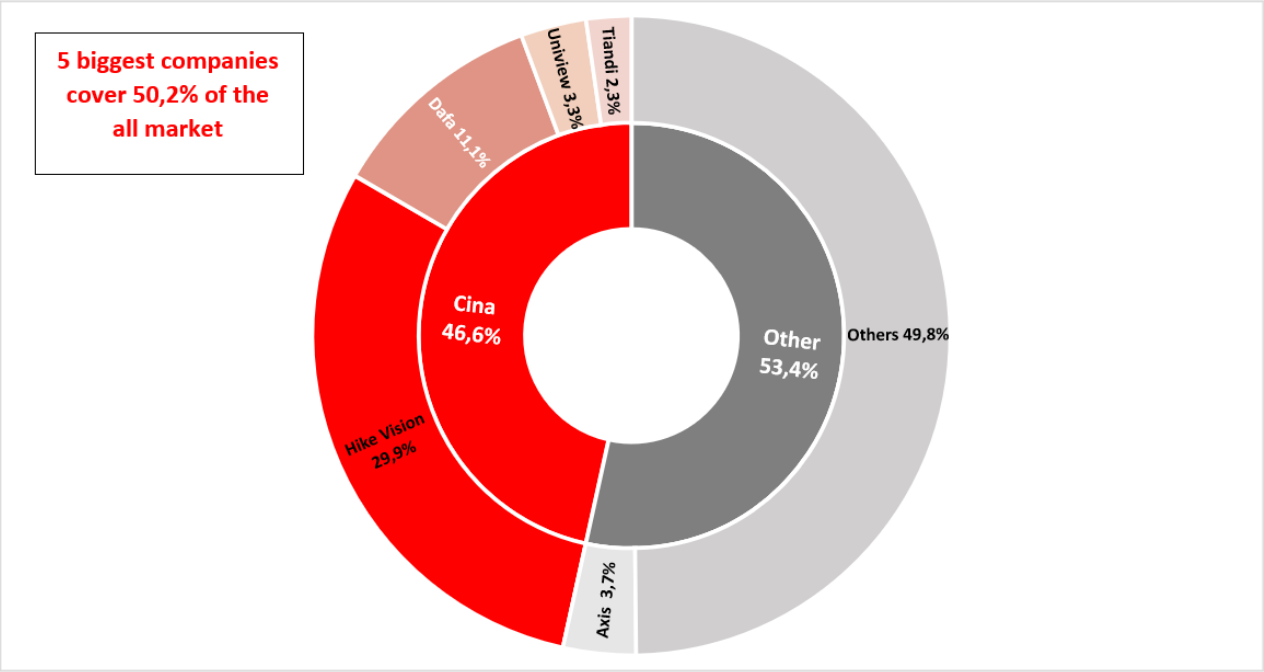


Figure 16: network camera market shares by units sold

Source: own representation based on Nikkei v.data

2.5 Key success factors

Innovation is undeniably the main success factor for all the companies operating in digital camera, multifunction device, medical device and network camera industries. The evolution itself of these products demonstrates that innovation has always been the main driver to create value for customers. For instance, whatever is the company, doctors are mainly interested in the new imaging technologies integrated in a medical device that guarantees better diagnosis, because the importance of the brand image is marginal in comparison with the technological advancements in these fields. Since vast resources are required to be an early adopter of such complex technologies and it is unrealistic to expect any single entity to explore everything by themselves, open innovation is becoming an important strategy for companies to strengthen their R&D capabilities[26]. Therefore, companies competing in these industries are increasingly promoting research contracts with universities and research institutions.

Responsiveness is another key factor for those firms that aim the market leadership. The ability to understand and fast respond to external changes do not just concern customers' preferences but also competitors' capabilities. Indeed, takeover and acquisition strategies are alternative solutions to open innovation that equally allow to internalize profitable technologies and competences. Flexibility is the first requirements a company must manage in order to react to market trends. The firms which gained best results in digital camera sector during latest years, for example, are those that firstly understood the new trend of mirrorless cameras. However, this ability to collect data is not enough to gain a sustainable competitive advantage. Next, the companies must adapt the production in accordance with new customers' preferences and sometimes stop researches that would not yield any return.

The third key success factor is the productivity. Especially for all those businesses that have already reached the maturity stage such as digital camera and multifunction device market, it is fundamental to satisfy the product demand with a cost effective structure. When it is almost impossible to create value with product

[26] Cf. Canon global website.

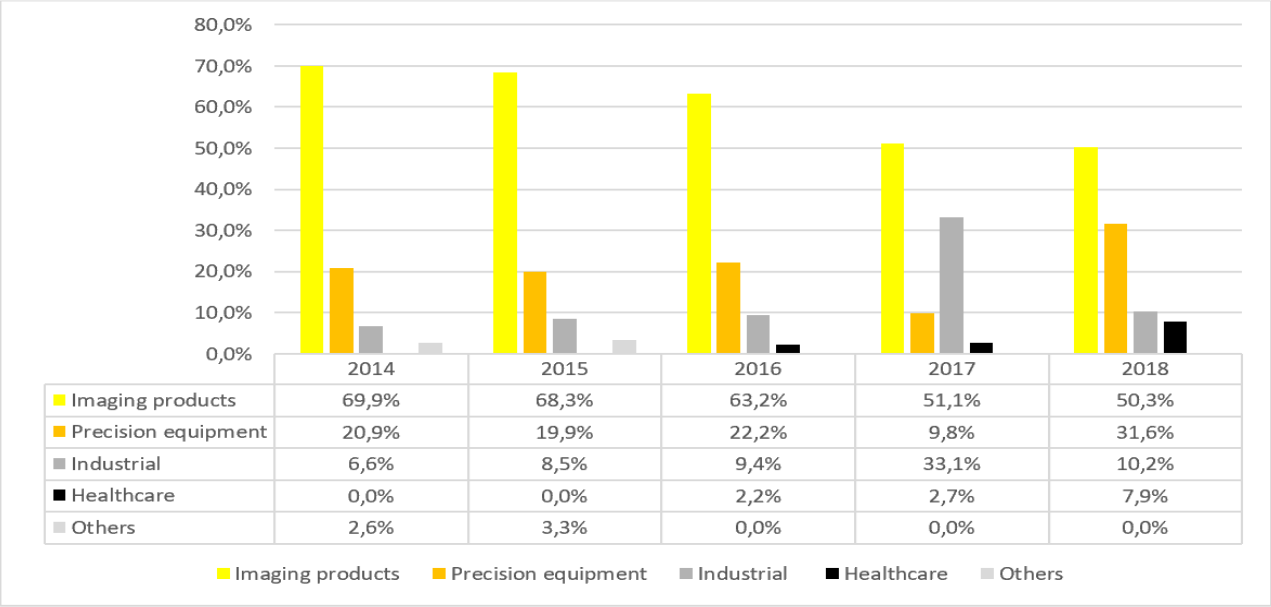
innovations because of intrinsic technological limits, organizations transfer their investments from product to process R&D in order to reduce the costs and be ready for a price competition, which is typical of the market maturity stage. In order to reduce costs, companies make advances in assembly automation and robotization, promoting cost-efficient design starting at the development stage and pursuing in-house production[27]. Furthermore, the manufacturer functions try to use common components and generic parts across several business divisions.

In conclusion, there is not only one key factor, but a combination of organizational capabilities that must be pursued simultaneously because they clearly have influence on each other. For instance, the innovation factor can be enforced only if the company is able to catch new ideas from different sources and to distinguish which ides should be selected for further in-house implementations and which not.

2.6 Competitors positioning

Nikon

Nikon is a Japanese company operating in a wide range of businesses centred around specializations in imaging products, precision equipment and instruments. Together with Canon is probably the best well-known brand in digital camera sector, but, similarly to this company, Nikon has differentiated its portfolio in latest years. In the 2018 annual report is said that the company gained 717 billion yen (almost 6 billion euros) of revenues thanks to its businesses. United Stated is the main market (24,8% of total revenues), but good results can be found also in China (22,7%) and Europe (17,1%). Leveraging its core opto-electronics and precision technologies, Nikon has developed a varied business portfolio. This portfolio includes the Imaging Products Business, which supplies digital cameras and interchangeable lenses; the Precision Equipment Business, which offers FPD lithography systems and semiconductor lithography systems; the Healthcare Business, which provides biological microscopes and ultra-wide field retinal imaging devices; and the Industrial Metrology Business, which handles industrial microscopes and metrology systems[28].



	2014	2015	2016	2017	2018
Imaging products	69,9%	68,3%	63,2%	51,1%	50,3%
Precision equipment	20,9%	19,9%	22,2%	9,8%	31,6%
Industrial	6,6%	8,5%	9,4%	33,1%	10,2%
Healthcare	0,0%	0,0%	2,2%	2,7%	7,9%
Others	2,6%	3,3%	0,0%	0,0%	0,0%

Figure 17: evolution of Nikon's portfolio (revenues by business segment)

Source: own representation based on Nikon 2018 annual report

[27] Cf. Canon annual report (2018).
[28] Cf. Nikkei annual report (2018).

In 2016 the management announced a period of business restructuring: the decline of the digital camera market forced the company to stopped operations at a manufacturing subsidiary in China, to end sales of products via the Internet in Brazil, and to take other steps to cut fixed costs by reorganizing production and sales. Conversely, the Healthcare Business Unit is expected to become a major driver of Nikon's future growth through the expansion of its existing operations and the creation of new businesses[29]. This decision was mainly motivated by the bad results of its imaging products, which are visualized in *figure 18*, achieved in last 4 years. The data concerning Nikon's net sales, shows how many difficulties the company has in operating in a shrinking market. From 2015 the net sales growth rate of Nikon has always been lower than the industry's one, except for 2018. 2017 certainly was the worst year for Nikon: parts of procurement activities were impacted by the Kumamoto earthquakes in April 2016; in addition, Nikon were forced to cancel the release of a premium compact camera and this inconvenience negatively affected the brand image. Consequently, Nikon is progressively reducing its range of digital cameras supplied and has concentrated its resources on high-value added products such as mirrorless and DSLRs.

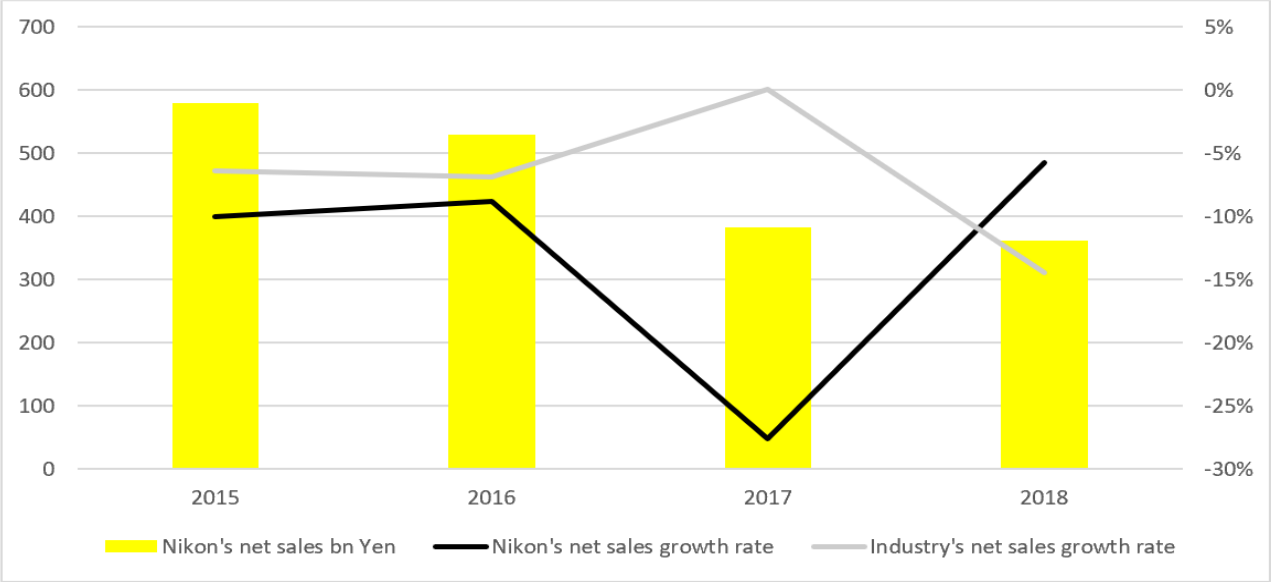


Figure 18: Nikon's net sales in billions Yen and net sales growth rate of Nikon and overall digital camera industry in %

Source: own representation based on Nikon annual reports (2015- 2018)

Fujifilm

Fujifilm is a Japanese firm engaged in in the development, production and sales of digital cameras, medical systems and office products. In 2019 the company gained 219 billion yen (more than 20,2 billion euros) of revenue by selling its items. Fujifilm's products are grouped in 3 product divisions: the Healthcare & Material Solutions is the major division in terms of revenues in the overall portfolio (43%); Imaging Solutions which embodies the manufacture of digital cameras and optical devices (16%); Document Solutions that mainly includes office products (41%). So far it has never been analysed any company whose main business does not correspond to its original activity. Although Fujifilm was founded as a pioneering photographic film maker in 1934, this business is almost marginal nowadays. At the moment, the manufacture of photo imaging systems is restricted to few digital camera models and instant photo systems. Despite of this narrow range of products, Fujifilm successfully faced the photography industry's crisis by launching old-fashioned models

[29] Cf. Nikon annual report (2018).

like instant photo cameras and avoiding further R&D expenditures. Instant cameras have been popular among young digital-native generations, especially in Asia. Furthermore, Fujifilm has continued to release attractive new products than soon became accepted by a wide range of users, particularly in North America and Europe[30]. In *figure 19* is visualized the Fujifilm's net sale growth rate which has always been greater than the industry's one. In 2017 and 2018 can be observed the biggest performance gap with other competitors: the net sales were speeded up by instant cameras in the European and North American markets; such good results can be also explained by strong sales of mirrorless cameras like GFX 50S which is equipped with a large size sensor. The deep involvement of Fujifilm in the medical field can be clarified by its entrepreneurial history. Fujifilm, indeed, was the first company operating in the digital camera industry that diversified its portfolio by allocating technological competence to the healthcare sector. Fujifilm launched its first X-ray film product in 1936 and introduced the world's first digital X-ray imaging and diagnostic system in 1983. Then, the combination of in-house R&D and the implementation of important acquisitions such as radiopharmaceutical manufacturers, chemical producers and ultrasound diagnostic equipment manufacturers, strengthened its capabilities. According to Shigetaka Komori, the Chairman and CEO of the firm, this diversification of the portfolio was supported by several common competences between the digital camera industry and the medical field. For instance, many of advanced technologies accumulated through the development of photographic film technology can be applied to the pharmaceuticals business, such as synthesis and design technologies that help increase efficiency in the drug synthesis process, and analysis technology for understanding new mechanisms of drug agents[31]. At the moment the healthcare division embodies different businesses in the fields of medical systems, pharmaceuticals and regenerative medicine. In 2019 this division gained 480 billion Yen (4 billion euros) of revenue (+39% in last 3 years).

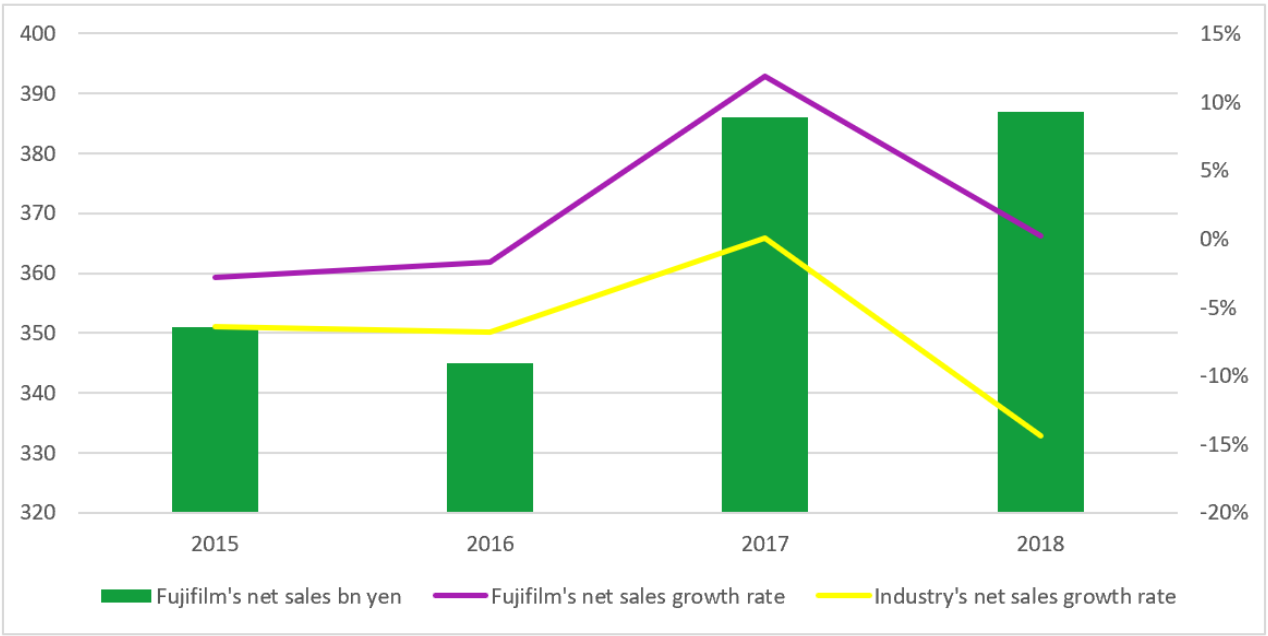


Figure 19: Fujifilm's net sales in billions Yen and net sales growth rate of Fujifilm and overall digital camera industry in %

Source: own representation based on Fujifilm annual reports (2015- 2018)

[30] Cf. Fujifilm annual report (2018).
[31] Cf. Fujifilm annual report (2015)

Olympus

Olympus is a Japanese manufacturer of optics and medical equipment that was founded in 1919 with the purpose of producing microscopes domestically. Next, the company's production has evolved over time and now Olympus operates in 4 main businesses. The Medical business unit is engaged in the manufacture and sale of gastrointestinal endoscope which helped the company to become the market leader of this segment; the Scientific business unit is primarily involved in the production of microscopes; the Imaging business unit manufactures digital cameras and recording machines; finally, the Others business unit operates in the biomaterials industry. In 2018 Olympus obtained 786 billion Yen (6,6 billion euros) of revenue which are nearly equally divided in its four strategic regions: the first market is North America (33,4%), followed by Europe (24,3%), Asia/Oceania (20,4%), Japan (19,6%) and Others (2,4%) that includes South America and Africa (Cf. Olympus annual report 2019). In 2018 the Imaging business unit obtained almost 500 million euros (7,7% of total revenue) mainly thanks to mirrorless cameras. Olympus, which is the fifth biggest player in the digital camera industry at the moment, has really suffered the decline of this sector. As *figure 20* shows, the growth rate of the company has always been negative and, except for 2018, has performed worse than the average. The lower net sales are explained by an explicit strategic decision of the company which developed a conservative sales plans in order to minimize the operative costs associated to a shrinking market[32]. According to this strategy the Imaging business unit is supposed to create profit, despite the reduction in sales, by revising cost structures and strengthening products with a high-profit margin such as interchangeable lens digital cameras[33].

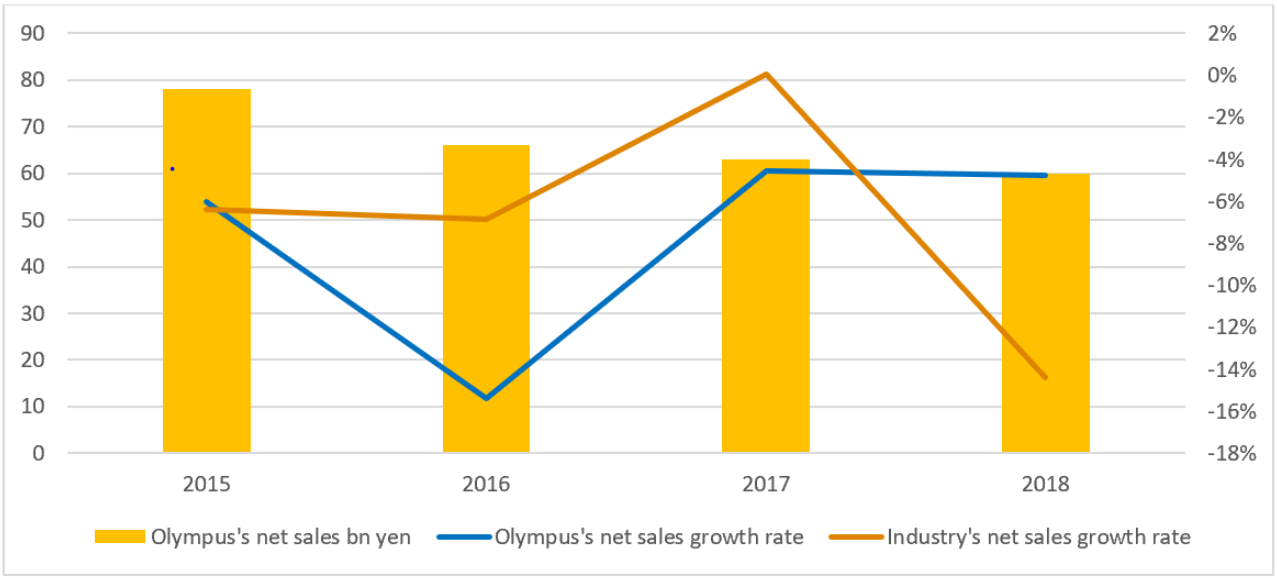


Figure 20: Olympus's net sales in billions Yen and net sales growth rate of Olympus and overall digital camera industry in %

Source: own representation based on Olympus annual reports (2015- 2018)

3. Competitive advantages

Canon is indubitably one of the most successful company of the last decades. This statement is proven by its business history started in 1937 which is still going on with good economical results despite the crisis of the digital camera sector of the last years. The company has made innovation its main distinctive characteristic:

[32] Cf. Olympus annual report (2016).
[33] Cf. Olympus annual report (2018).

in 2019 Canon placed 3rd in IFI CLAIM 2019 US patent ranking and became the only company in the world to have ranked in the top five number of patents granted for 34 consecutive years. For these reasons it is not surprising the fact that Canon is currently one of the most well-known brand for customers all over the word. In 2018, the *Interbrand Rank,* which estimates the value of the brand and the brand awareness for customers, placed Canon at 55th world position. In this chapter the most relevant competitive advantages that made possible to reach these goals are going to be analysed. Before seeking what are the competitive advantages of Canon, it can be useful identifying the competitive strategies of the company which stand behind its success.

3.1 Hybrid strategies

The generic competitive strategy model of Michael Porter classifies three main options: *differentiation,* whose main purpose is appearing unique to customers; *cost leadership* which pursues the goal of offering products below the overall market price; *focus strategy* that applies the objectives of the previous strategies on a single segment. However, empirical evidences have shown that only few companies stick to these strategies and also Canon do not put in place none of these. Indeed, the Japanese firm is exploiting two hybrid strategies which integrate stream-lined processes, able to lower the operating costs, and the production of differentiated items that are perceived as unique to customers' eyes.

Total quality management is the first hybrid strategy Canon is following in order to achieve a sustainable competitive advantage over its rivals. The main idea behind this strategy is investing considerable resources in production processes in order to incur in as lower as possible defects and to grant higher quality products in comparison with competitors. Firstly, the company pursue this strategy by internalizing as much activities as possible with a vertical integration. The learning curves embodied in the manufacturing activity give to Canon, which operate in the camera industry from more than eighty years, a great advantage compared to later entrants. Moreover, the know-how of the technicians is a valuable resource for further innovations. Automatization is another tool to concretize the total quality management strategy. In the 2018 annual report of the company, is clearly stated that Canon is pursing the implementation of automated assembly lines to ensure reliable production of high-quality products at low cost. The efforts Canon is making concerning the manufacturing process is remarkable since the final objective is achieving a fully automated production which requires no human interventions.

The other hybrid strategy put in place by Canon is the *Modular production.* It basically consists in a shared set of common design and components among different products and model supplied by the company. This strategy is particularly applied by the firm on the so called LSIs (large-scale integrated circuit): they are chip containing all the hardware and software systems necessary to run a device. During the development of new LCIs, the verification process is a crucial stage. In fact, the new component is not only required to work without bugs or internal errors, it must be also compatible with as much as possible different . Although the design process is complicated and time-costly, huge benefits concerning quality and efficiency can be earned in return. The reuse of LCIs standardized models among different products lowers the development costs because only few modifications are usually required for new LCIs. Fixed costs are reduced too since the production plants do not need great changes to create new models. And finally, the presence of reliable LCIs models reduce the uncertainty and the risk of defects.

3.2 Resource and competencies analysis

3.2.1 Core and distinctive competencies

The ability of a company to gain superior economic performances in comparison with its rivals must be sought in the competitive advantage it reached during its business history. However, the results of competitive

advantage are constantly evolving for two main reasons. Firstly, the competitive advantage is a combination of superior competences (core and distinctive competences) and superior resources that change over time too. Moreover, the competitive environment in which the firm operates is not stationary and constantly modify the balance of power between competitors. For these reasons, the main strategic aims of companies concern how make a competitive advantage sustainable over time. So, in this section, it will be soon explored how Canon is dealing with the ongoing problems of the digital camera sector and what are its distinctive competences behind its competitive advantage.

In chapter 2 it has been pointed out that the decline of the digital camera sector is principally due to the outstanding technological improvements of smartphones, which are substitute goods of digital cameras. Despite of this problem, Canon has achieved a competitive advantage over its rivals thanks to two different distinctive competences. Canon is indubitably superior in providing top quality products for professional and amateur photographer and, at the same time, its brand is probably the most attractive in the market at all. The 2018 Nikkei report shows that Canon is the market leader of the interchangeable lens camera market for units sold (49,1%) and obtained better results than Nikon (24,9%) and Sony (13,3%). Apart from these data, everybody's personal experience supports this idea: looking at sports or other social events, it can be said that most of professional digital cameras are branded by Canon. Starting from the first distinctive competence, that is to say the ability to supply top quality products, now it can be seen what the sub competencies and activities are. Canon is particularly able to take advantage of the technological discontinuities of the sector. The R&D process is not only based on in-house researches because the field of investigation would be too wide and too time-costly. That is why the company is pursuing an open innovation approach based on partnerships with external organizations to gain new advanced technologies and booster the development of new products[34]. A careful and in-depth focus on global tech start-ups is carried out too in order to proceed with profitable merger and takeover. The other relevant sub competences leading Canon to supply top quality products, must be searched in the manufacturing process. Like no one else, Canon can supply zero defects products thanks to an almost fully automated production that drastically lowers the possibility of human mistakes and reduces the cost of labour. Lastly, the quality of the digital cameras is granted by LSIs (large-scale integrated circuit) which are compatible for different camera models. Since LSIs are one of the most crucial element of a camera, Canon is particularly meticulous in conducting tests to avoid any possible defect. For instance, one of the Canon's best technology is the DIGIC 8 image processor. This processor is particularly high-speed in comparison with those of other companies and can simultaneously grant the autofocus, the image stabilization and the live-view display.

In the ranking of "*Best global brand 2018*" created by Interbrand, Canon is one of the 100 most valuable brands (55°) and the only company operating in the digital camera sector listed.

[34] Cf. Canon sustainability report (2019).

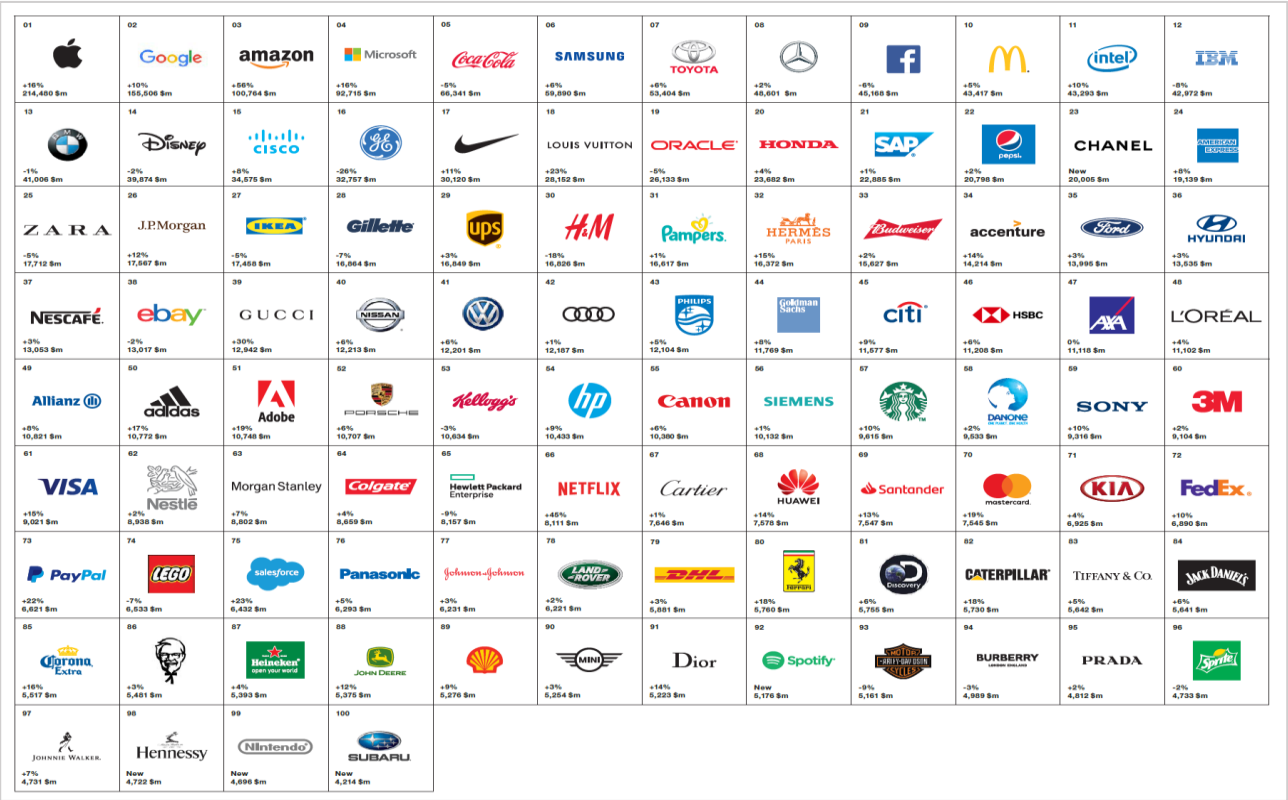
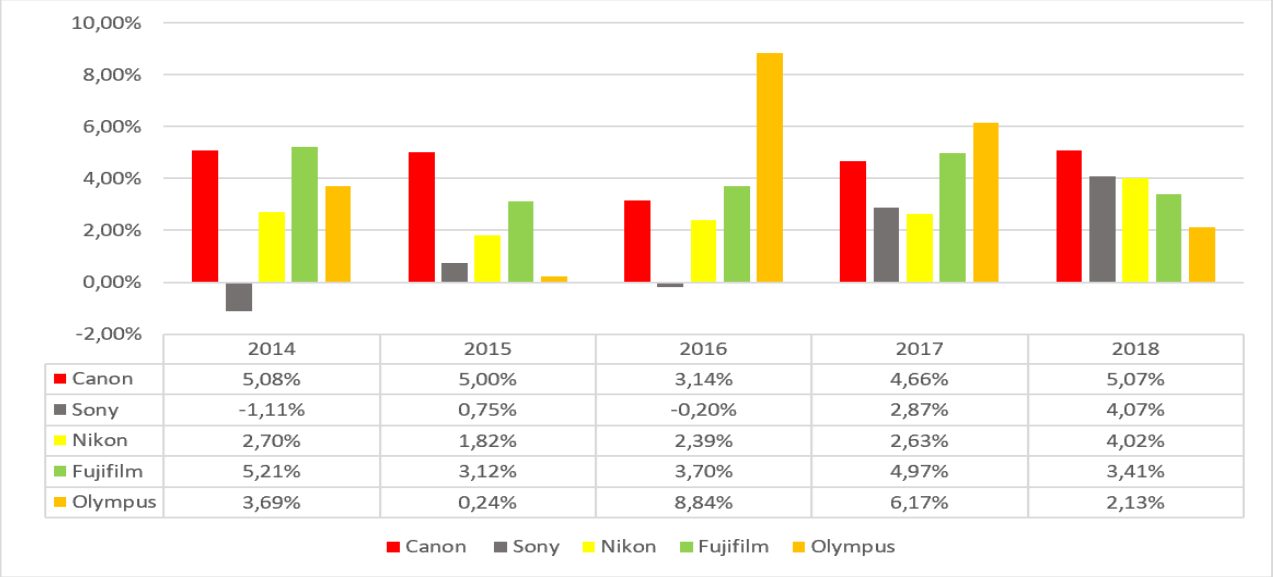


Figure 21: evaluation of top 100 most valuable brands

Source: *Interbrand*, best global brands of 2018

Therefore, the brand image is surely another distinctive competence of Canon. Such an important visibility has been reached during these decades thanks to several important sponsorships. For instance, in 2020 Canon is the official printing and imaging provider of Expo 2020 in Dubai.

In the second chapter, as proven by the sales reports, it was said that the digital camera market has already reached the maturity stage and will be soon affected by the economic consequences of the decline stage. In a such crucial moment, maintaining an efficient cost-profit structure is essential in order to achieve good financial results. Canon, thanks to its modular production and the process innovations it put in place, is succeeding in this objective. This ability can be defined as a core competence: a capability which is essential to create value, but it is also possessed by other competitors. As shown in the following chart, the Return on Assets of Canon reached good levels in last five years, and in average, were better than those of the competitors (Average ROA of Canon 2018-2014= 4,59%.)



	2014	2015	2016	2017	2018
Canon	5,08%	5,00%	3,14%	4,66%	5,07%
Sony	-1,11%	0,75%	-0,20%	2,87%	4,07%
Nikon	2,70%	1,82%	2,39%	2,63%	4,02%
Fujifilm	5,21%	3,12%	3,70%	4,97%	3,41%
Olympus	3,69%	0,24%	8,84%	6,17%	2,13%

Figure 22: Canon's and main competitors' ROA (2014-2018)

Source: own representation based on annual reports (2014-2018) of Canon, Sony, Nikon, Fujifilm and Olympus

3.2.2 V.R.I.O.- framework

The description of the main competences and resources behind the competitive advantage of Canon has been presented. Now, the V.R.I.O. framework which is going to be carried out in this section, will make a step forward for the analysis. According to this scheme, resources and competences can have different characteristics in terms of the contribute they provide to the competitive advantage. Indeed, depending on the types of resource/ competences and in the measure they are possessed by rivals too, a company can reach different level of a competitive advantage. Of course, the scarcer the resources owned by the company are, the greater the competitive advantage and economic returns (profit) it can obtain by caring out its business. The next table gives a track of the main characteristics of the Canon's resources and competences and it is a starting point for the following explanations.

V.R.I.O. FRAMEWORK	Valuable	Rare	Costly to imitate	Appropriable by Organization	Competitive Implications
Patents	Yes	Yes	Yes	Yes	Sustainable advantage
Modular production	Yes	Yes	Yes	Yes	Sustainable advantage
Brand loyalty	Yes	Yes	Yes	Yes	Sustainable advantage
Reputation	Yes	Yes	Yes	Yes	Sustainable advantage
Social commitment	Yes	No	No	Yes	Competitive parity
Product mix	Yes	No	No	Yes	Competitive parity
Procurement Policy	Yes	Yes	No	Yes	Temporary advantage

Table 4: VRIO framework of Canon

Source: own representation based on Canon's annual reports and Canon's corporate website

Patents

Probably the most important strength of Canon is its innovative capacity, as demonstrated by the high number of patent application the company can produce every year. However, without an effective communication of the high-quality technologies inside each product, patents would not be a valuable for customers. Canon, which is well conscious of the importance of making potential customers aware of new technologies and their benefits, has always invested on the marketing and sales operations. Undoubtably, patents are rare resources since they are a unicum. The imitation of a patent is forbidden by low, so these resource are not imitable. Generally, the industrial patent rights expire after 20 years from the registration, but this is not a problem for Canon because it is able to develop new more advanced technologies meanwhile. Moreover, this resource is not very appropriable by employees: researchers are fundamental for the company, but they do not have a great bargaining power because a patent is the output of different actors such as universities, third-party institutes and researchers working inside the company.

Modular production

Modular production has a concrete value for customers since it is an instrument to supply products with no defects and to make several Canon's products compatible with each other. This particular manufacturing process can be considered rare too: other competitors makes use of automated productions as well, but the extent to which Canon designs and create modules is incomparable. For example, one of the main objectives for next years is creating a full automated production. This resource is not easy to imitate due to the complexity of production lines and because of several patents registered about production processes.

Brand loyalty

Customers buying a digital camera, especially top level cameras such as DSLRs, are deeply loyal with just one brand. For this kind of product, customers are generally split in Canon users and Nikon users. Having several "attached" customers who assign value to the brand itself, is both a valuable and rare resource. Moreover, it rarely happens that users modify their digital camera choice because of high switching costs. In fact, the manual and advanced settings differ from brand to brand and requires long time to learn how the camera works. Of course, this resource is almost impossible to imitate and it is the result of several years of effective customer care and marketing policies. Since there is not a category of employees which is the only creator of Canon's brand loyalty, the risk of appropriability by employees do not occur.

Reputation

The long and successful business history of Canon is unique and cannot be imitate. People buying a Canon camera associate a value to the reputation of a company because it is a synonymous of quality and reliability. Similarly to the brand loyalty, the development of the Canon reputation is the result of a shared effort between different categories of employees, so the risk of appropriability is very low.

Social commitment

In the last few years, Canon is enforcing its social commitment by tailoring its activities on the basis of the SDGs (Sustainable Development Goals). This set of objectives, shared both by governments and companies, is a guideline to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030[35]. Being a social committed company is becoming more and more important for customers. Indeed, people have all the instruments to investigate about labour conditions, CO2 emissions etc. nowadays. Because of the importance of these social issues, all the other competitors of Canon have adapted to the

[35] Cf. United Nations webpage- section dedicated to SDGs.

SDGs. Sticking to these guidelines is not very costly to imitate since no particular resource or competences must be developed in-house. Social commitment can be considered an easily-appropriable resource by the organization because the efforts to reach this objective is split among different categories of employees.

Product mix

The overall number of products supplied by Canon among all the 4 business units is enormous. Vertical differentiation, that is to say offering products with different level of quality at different prices, is valued by customers because they can choose the product that better match with their preferences. However, competitors have exploited this strategy too and have created business units very similar to Canons'. Putting in place this strategy is quite easy to imitate since mergers and takeovers give the opportunity to differentiate the company's business.

Procurement policy

In 2017 Canon asked its suppliers to collaborate for the procurement activities with the aim of following together the guidelines of the Sustainable Development Goals. Canon is particularly careful to the source of minerals used for semiconductors, which are sometimes commercialized by criminal groups in Africa. The strong social responsibility concerning this issue is well perceived by consumers because they are becoming more and more aware of the environmental and social problems of the ongoing situation. Canon has been the first company of the sector who took such a strong position concerning this problem; however, also other rivals are expected to follow the SDGs in next years.

4. Innovation and competitive advantage

Innovation is generally defined as an introduction of new ideas or improvements that create value to the company's activities. The creative process of innovation spans a huge number of different disciplines and can be concretized into organizational innovations, new strategies, marketing methods, product and process innovations. The theories of Joseph Schumpeter, which have considerably influenced the concepts about innovation, point out the disruptive power of some new technologies which are able to change all the balance of power between companies and their competitive advantages too. For this reason, the technology industry which embeds several new innovations, can be considered a challenging environment for Canon. Despite this, the firm has demonstrated to be a leader in discovering new technologies, to apply them to its products and optimize the production process. Innovation is crucial to satisfy the high expectations of customers and respond to the continuous evolution of the market. Canon's innovation approach mixes both open innovation and in house research. For what it concerns traditional businesses (digital cameras and printers) the company takes advantage of the learning curves and the experience of its researches by developing most of the new technologies in-house. Conversely, too vast resources would be required to be an early adopter of very complex technologies such as semiconductors and medical equipment. That is why, Canon also collaborates with universities and other companies.

4.1 Product and process technology-based innovation

The history of Canon has always pointed out the ability of the company to carry out a continuous product innovation. Innovation is a key success factor for Canon because it gives to the company the opportunity to gain a competitive advantage and maintain its competitiveness over time. Looking at the five-years corporate strategy of Canon (2015-2020), two strategies aims to support the innovation process inside the company: "*Establish a new production system to achieve a cost-of-sales ratio of 45%*" and "*Enhance R&D capabilities*

through open innovation". So, while the first strategy focuses on searching more efficient production processes, the second one concentrates on creating new product innovations with the support of third parties.

In this section, it is going to be seen that Canon has two different strategies to support product innovation according to the businesses it manages: in-house research and development for traditional business (digital cameras and printers) and open innovation for semiconductors, medical equipment and other new businesses. These two different approach are justified by different conditions in terms of resource and competences, complexity of the research field and potential outputs of innovation (incremental or radical innovation). From one hand, Canon has collected during its business history very valuable competences and an in depth knowledge of the technologies beyond digital cameras and printers; that is why the related researches are almost completely conducted inside Canon's facilities. Then, the expected results of these investigations are incremental innovations because all the innovative potential have been exploited by Canon and other competitors. Conversely, the collection of resource and competences about new businesses is at first stages: for instance, the medical equipment business unit was founded in 2016. Moreover, the researches about these scientific and technical subjects investigate new fields and can lead to inventions, which can be transformed in radical innovation at a later time. However, too big resources and time would be required to internalize all the research and development functions about these businesses. That is the reason why Canon is supported by collaborations with universities and other companies.

Before the commercialization of a product with new technologies inside, the innovation process put in place by Canon is divided in three main steps. At first step, the advanced research, the Canon group collaborate with third parties such as universities and other companies. The combination of theorical knowledge provided by academics and technical experts is usually profitable for both parties. For instance, in the Healthcare Optics Research Laboratory in Boston where both engineers and researchers collaborate, Canon has recently succeeded in developing an ultra-miniature fibre endoscope by leveraging on its technological strength in the micro-optic area. While most of research centres managing medical devices, commercial printers and network cameras are placed overseas, the R&D of technologies for digital cameras are all conducted in Japan. The following stage ensures that all new technologies can be integrated with the other components inside the product. It means that just few technologies are selected and can proceed to the final step. Finally, in the development stage, Canon adapts its automated production lines to the new component. This operations grants a reduction of product defects and lowers the production costs.

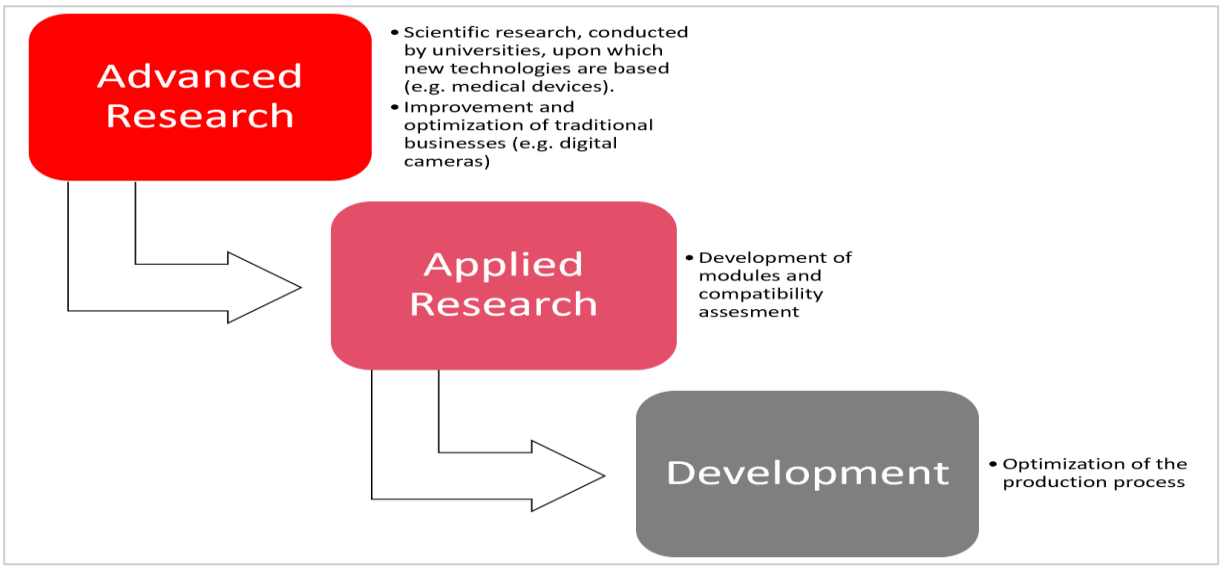


Figure 23: Canon's innovation process

Source: own representation based Canon's corporate website, applied technology section

As shown in *figure 24*, the research and development exploited by Canon for the production of new digital cameras, is based on 3 core competences: the optical technology, the sensor technology and the imaging processing technology.

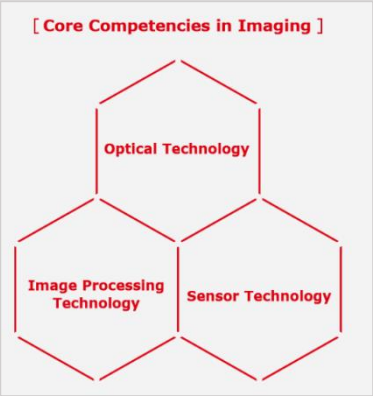


Figure 24: Canon's core competences in imaging

Source: Canon's corporate website, applied technology section

One of the most cutting-edge technology built by Canon in latest years is the *Digic 8* image processor. The quality of this component is vital for the resolutions of the photos and that is why Canon has invested several resources for the development of this image processor. The image processor is a key component for digital cameras because it converts the light entered via the lens into image data. Consequently, the better the quality of the processor, the higher the resolution of the photos and more precise the reproduction of natural colours. Because of the importance of this technology, Canon has also patented all the algorithms used by the *Digic 8* image processor which makes it possible to reduce noise while preserving high resolution, even when shooting in low-light situations. Moreover, this processor is an output of the modular production of Canon. Indeed, the *Digic 8* is a large-scale integrated circuit (LSI) which is patented too because it is faster than using multiple chips connected by wires.

Canon has also made important progress in the production of digital camera sensors. In 2013 the Japanese company launched the *Dual Pixel Autofocus technology (DPAF)* which can be considered a radical innovation. In the devices in which this technology is installed, each pixel of the image sensor has two separate light-sensitive photobodies which work independently from the other. In all other models some pixels are used for focus and the rest for the image recording, but none does both the operations. So, when a photo is taken, the two photobodies collect and combine different signals. Comparing a Canon camera with DPAF inside with another competitor's camera, it can be seen that the first one has several millions of phase detection auto focus point, against some hundreds of the other one. However, this technology is installed only on top-level cameras and are mostly used by professionals due to the high price. With this technology Canon has captured the majority of the niche of professional users: indeed, the possibility to easily takes photos always on focus is incredibly valuable for most of them. Before the introduction of the *Dual Pixel Autofocus technology,* Canon, similarly to the other competitors, developed incremental technologies to improve its digital camera sensors. In 1987 the company launched its first autofocus technology with a single focus point at the centre of viewfinder. Then, in 1990 the focus points were increased to 3, 5 in 1992, 45 in 1998 and 61 in 2012. Although the *Dual Pixel Autofocus technology* is patented by Canon, in 2017 Sony announced the discovery of a competing technology, very similar to the DPAF, that can be consider a threat for Canon: the 4D Autofocus. The future of these technologies is not clear at the moment, but a battle for a leading technology is expected.

The most remarkable innovation made by Canon concerning the optical technology in latest years is the *Hybrid IS (Image Stabilizer).* Thanks to an accelerator sensor embedded in the interchangeable lens, it makes it possible to correct the shakes while taking a photo. This technology enhances the effects of the image stabilizer and it is particularly effective during macro shooting (when the zoom is used). This innovation can be considered a great achievement for the company since the researches started in the 1980s and Canon was the first to develop an optical image stabilizer.

The competences Canon has collected for its new business has required a different strategic approach. Indeed, Canon cannot leverage its long tradition and knowledge in manufacturing cameras for those sectors in which it has been operating from just some years. In order to speed up the learning process of new technologies and be competitive on the market, Canon is following two corporate strategies: open innovation and mergers &acquisitions.

For what it concerns the network camera sector, Canon has strengthened its business thanks to important acquisitions. In 2013 the company acquired very famous firms operating in the market such as Axis and Mileston because of their know-how and their networks of retailers and suppliers. If Canon had developed all this business network on its own, it would have required too much time and resources and it could have been very risky. At the moment, the strategy exploited by Canon consists in a profitable contamination between the optical technologies developed during the company's history and the latest network communication technologies. However, Canon is aware that the potentiality of a network camera can be leveraged only with an adequate software, and that is why the Japanese company has made consistent investments also on video analysis technologies. The software "*People counter*" installed on Canon's network cameras is having a great success thanks to its multifunctionality and it can be considered a radical innovation. The main strength of this technology, which is able to count individuals up to 1500 people, is its different usages. This software is especially applied for marketing researches since it is able to record the movements and the behaviours of customers inside shopping centres. On the other hand, the network cameras can be used by the police in order to prevent crimes and terrorist acts. At the moment, because of the Covid-19 safety rules, this technology is particularly useful to avoid crowds inside a building.

Canon expanded its portfolio and its competences about commercial printers with the acquisition of the Dutch company Océ in 2010. Similarly to the acquisitions made in the network camera sector, this acquisition was a strategy to fast collect the assets and competences of a leading company with 140 years of business history. Most of the new commercial printers produced by Canon and Océ was created with the aim of solving a common need among customers: the possibility to print a short-run production and personalize print media. All the latest efforts of the research and development department focused on digital printing, instead of offset printing, which is advantageous only for high printed volumes and it is much less flexible. The Océ ProStream 1000 is a result of such research and development. This product is suitable for the ongoing digital marketing requirements because more and more companies are utilizing data to customize printed messages. Consequently, Canon succeed in expanding the number of potential customers and meeting different needs thanks to this product.

The medical system business unit of Canon works closely to universities, academics and other companies to booster the research and development on this field. Such an open innovation approach is justified by the enormous opportunities that can be exploited through medical innovations. Because of the vastness of the potential studies that can made, it would be impossible for Canon to internalize all the research and development process. That is why Canon has adopted a clear division of the R&D activities: academics are in charge of the basic researches and presents to Canon's engineers new ideas and discoveries that could be transformed into inventions after the applied research (conducted internally by the company itself). The extent of this strong collaboration is suggested by the website of Canon medical system. Here there is a

dedicated section in which are available medical publications and discoveries made thanks to Canon's machines like magnetic resonance devices, X-Ray systems and ultrasound machines.

Innovation is a core value for Canon as demonstrated by the evolution of its products. However, the outputs of the research and development division are required to be profitable in order to positive contribute to the company's performance. Profits can be earned by innovations if two conditions are fulfilled. First, innovations must be valuable for customers, so they must be aware of the advanced technology inside the product and must be willing to pay more. Secondly, Canon must be able to appropriate the value of innovation by enforcing its intellectual property rights with legal protection means. Because of the great number of patents registered by Canon, the policy on intellectual property put in place by the company is extremely rigorous. The Corporate Intellectual Property and Legal Headquarters at Canon Inc. is in charge of seeking intellectual property infringements of third parties and fight against counterfeit goods. At the same time, Canon is careful to respect the intellectual properties of other companies in order to avoid potential legal issues. This guideline is implemented by a solid collaboration between the legal headquarters and the R&D division. The legal headquarters is also in charge of managing the intellectual property portfolio by maintaining only those patents that are considered essential. Conversely, other property rights are shared with other companies through the *License of Transfer Network* where the license for patents are granted to other parties without any compensation.

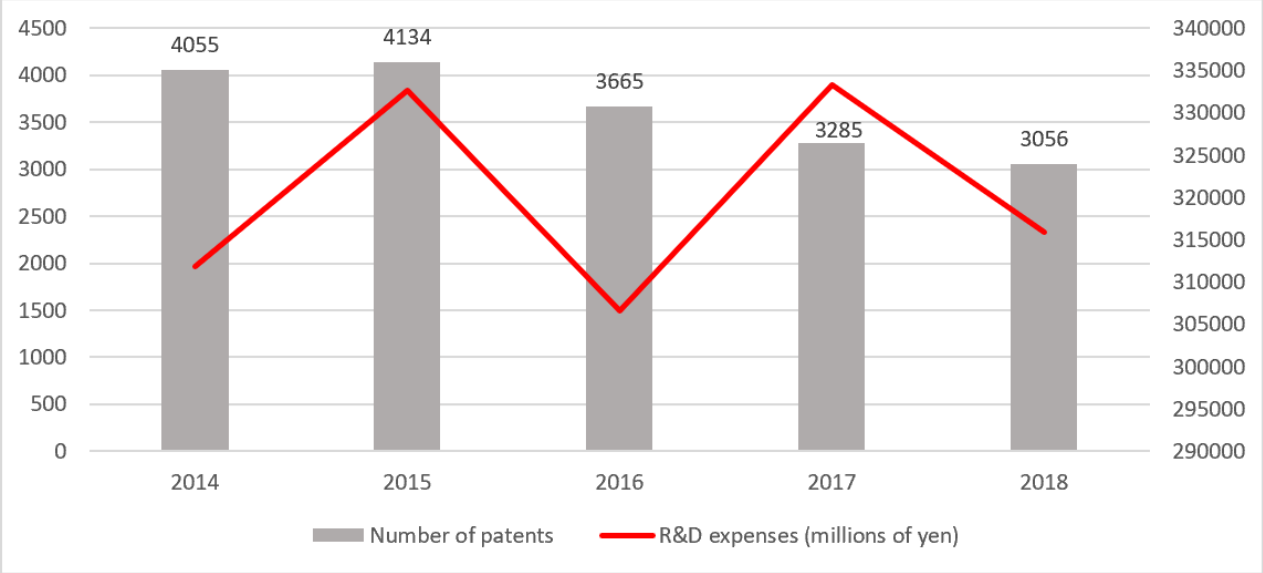


Figure 25: number of patents registered and R&D expenses (2014-2018)

Source: own representation based on Canon's annual reports (2014-2018)

In *figure 25* there is a breakdown of the number of patents registered by Canon and its expenses in R&D (millions of yen) in the last 5 years. After an increase in 2015, the number of patents registered has always declined. During the same year (2015), it can be observed that a growth in the number of patents corresponds to more R&D expenses. Despite of this, these two indicators do not move in the same directions for all the other period. Moreover, the chart shows that the biggest decrease in the number of patents (-469 from 2015 to 2016) occurred in the same period in which it can be also observed the biggest decrease in the research and development expenses (-26141 millions of yen from 2015 to 2016). For this reason it could be argued that a budget cut in R&D has led to a reduction in the innovation output of the company. In terms of simple number of patents registered this idea could be true, but what matters most is the value of these intellectual properties.

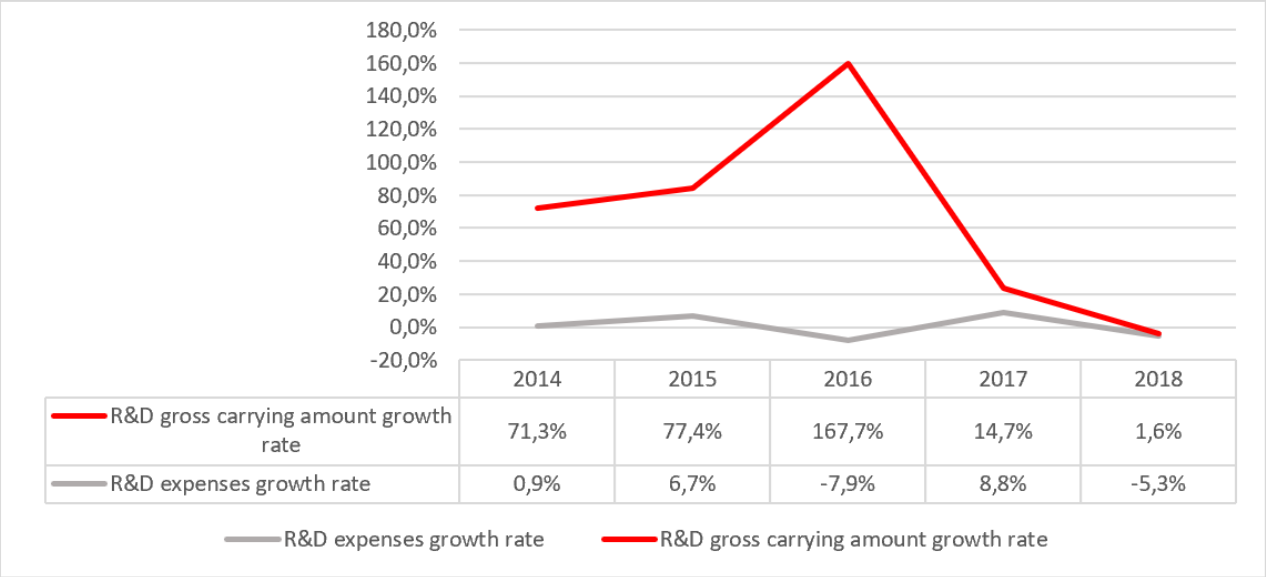


Figure 26: growth rate of intangible assets value and growth rate of R&D expenses

Source: own representation based on Canon's annual reports (2014- 2018)

The *figure 26* summarizes the costs and the value of Canon's innovations. It can be said that the Japanese company has achieved great economical results from its research and development department despite of some budget cuts. In fact, the growth rate of the gross carrying amount of R&D, which evaluate the value of intangible assets such as the patents, has always been positive, although the investments for R&D declined in 2016 and 2018. In conclusion, in last five years, Canon succeeded in enhancing the value of its patents, though it operated some cost reductions.

All the sectors in which Canon is involved requires high levels of precision and reliability during the manufacturing process. These principals are granted by an automated production, which is going to become more and more fundamental according to the Canon's corporate plans. In fact, Canon is owner of automation systems that covers all its business and avoid human mistakes during the production activities. Together with efficiency and low costs, another important strength of Canon's automated production lines is the flexibility. For instance, the glass bold used for the manufacture of lenses can be easily changed according to the market demand or the develop of new lenses. Moreover the company makes use of simulation analysis technologies that allow accurate prediction of the glass deformation process. Other competences above the average can be found in the production of semiconductors. The company has developed proprietary mounting technologies that reduce the dimension and weight of chips. This technology, which is called *System in Package,* actually stacks in a single package multiple semiconductors like the memory and the processor.

4.2 Strategic, organizational and marketing innovation

The success of Canon in building efficient automated production lines can be sought in its vertical integration strategy: the development of these process technologies was all conducted by Canon's engineers as well as the manufacturing activities. Then, a strong communication between the product development teams and technicians has made it possible to lower the product defects. In the last annual report of the company is also told that one of the great strength of the company is the optimization of its global production system. Actually, it was not possible to consider all the production facilities of Canon, but some consideration can be made. For example, in Asian countries such as China, Taiwan, Honk Kong, Malaysia, Thailand, Vietnam and Philippines are located 16 manufacturing subsidiaries which are all devoted to the production of traditional products such as digital cameras and printers. Since in these area there are no R&D divisions, it could be said

that these developing countries are functional to lower the labour cost and the state of art for these products do not require very high competences. Conversely, in western countries, the R&D divisions and manufacturing facilities are close located in order to enhance the internal communication and exploit new competences. For instance, Canon U.S.A is specialized in medical researches and healthcare optics, and the manufacturing activities are conducted there as well.

As previously analysed, one of the biggest strength of Canon consist in the manufacture of complex semiconductors called LSIs. The *figure 27* reports the organizational design behind the production of LCIs, which requires a great level of collaboration between engineers. Each development team is reinforced by two supporting tools: the GUI (graphic user interface) and the server farm. The first one, enhances the communication inside and across development team. On the other hand, the server farm is an internal platform providing a structured information about the company's technologies, in order to facilitate the work on design made by engineers. Above the development teams, there are other three structures contributing to the production of new LSIs. Configuration management automates the design-asset management process to make it possible to easily reuse the design asset[36]. Resource management supervises and encourages the communication inside and across development teams. Lastly, the defect management evaluates the progress of the projects and provides assistance in case of disorganization. While each project is developing, the automatic visualization tool gives to engineers a feedback about the design and progress of the development teams.

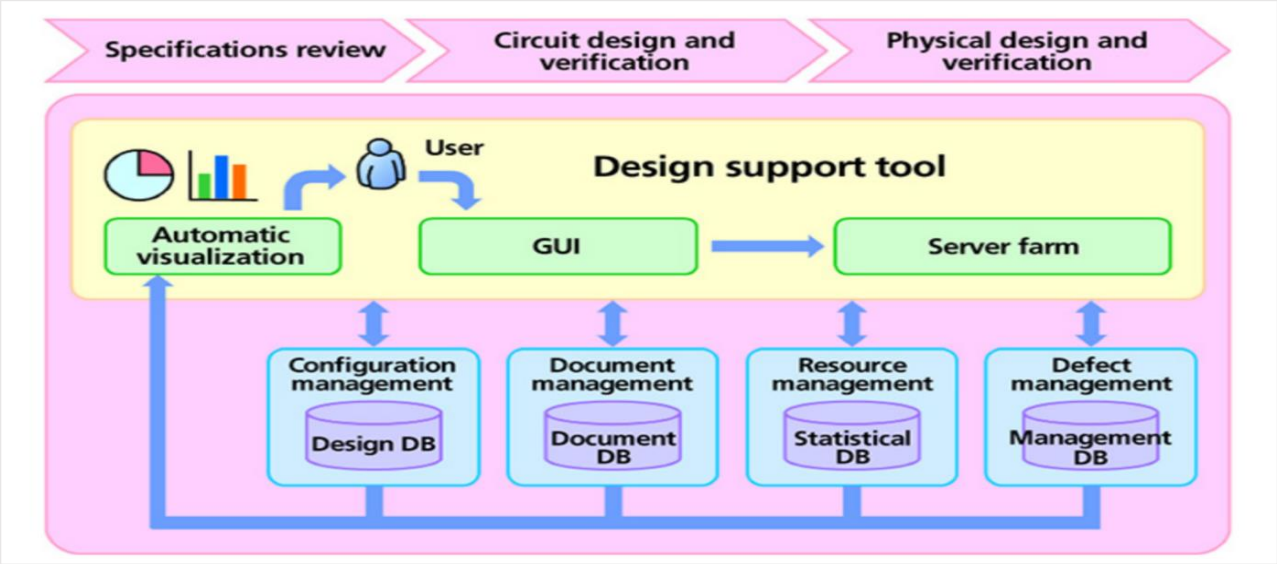


Figure 27: system LSI integrated design environment

Source: Canon's corporate website, research and development section

The local subsidiaries of Canon (Japan, Americas, Europe, Asia and Oceania) are directly responsible for the marketing and sales distribution in their geographic area, so the marketing strategies applied are different. However, some common features can be found. For instance, the use of social networks as a mean to enforce the global position of the company has become crucial. Canon manages a Facebook page for each country it has a considerable presence in. Having autonomous local subsidiaries is a great advantage to create personalized contents because they are close to their target audience. Canon is also used to launching photo contests during local festive calendars. This gives to photo amateurs the opportunity to capture emotional sceneries to which other people can feel connected. The use of social network is also a mean to interact with customers and provide useful information.

[36] Cf. Canon.global

4.3 Web based innovation

Canon does not integrate the consumer into the creative process of new products, and for this reason it can be said that the extent of web-based innovation is limited. Web-based innovation requires a deep knowledge of the technology that consumers do not have. Otherwise, people could be asked to contribute with their preferences concerning the design of the product, but this is not an important issue for items such as digital cameras. The role of customers is particular important for the usage of the product that, particularly for DSLRs and mirrorless, requires experience and knowledge about the manual settings of the camera. In latest years, several Canon's web communities were born in which Canon's users exchange their personal experience and opinions about new releases, product's strengths and defects and so on. The only collaboration Canon is conducting with users is that with some professional photographer. Canon selects some professionals as Canon's ambassadors who are in charge of sharing their technical know-how with people interested in developing their skills. The ambassadors are also partially embedded in the product development since they conduct pre-test on new cameras and lenses. The aim of this collaboration is meeting the new equipment with customers' needs. In conclusion, it can be said that Canon has not exploited all the potentiality of the web-based innovation approach, but the complexity of the product does not allow much more opportunities.

5. Financial performance

Canon finances (Millions of yen)	2014	2015	2016	2017	2018
Revenues	3.727.253	3.800.271	3.401.487	4.080.015	3.951.937
Cost of sales	1.865.780	1.865.887	1.574.679	1.825.581	1.762.171
Gross profit	1.853.553	1.990.554	1.671.998	1.934.384	1.861.472
Research and development expenses	315.842	333.371	302.376	328.500	308.979
Selling, general and administrative expenses	1.176.760	1.301.666	1.149.036	1.250.674	1.189.004
Operating profit	342.952	321.605	216.425	355.210	363.489
Net profit before tax and interest	362.897	353.884	244.651	347.438	383.239
Net profit	266.742	255.884	161.970	231.333	265.239
Gross cash flow (cash equivalent end of year)	520.645	721.814	630.193	633.613	844.580
Operating cash flow	365.293	590.557	500.283	474.724	583.927
Assets	4.899.465	5.198.291	5.138.529	4.427.773	4.460.618
Liabilities	1.881.552	2.102.116	2.143.907	1.243.310	1.319.860
ROE	8,26%	7,40%	5,20%	8,60%	8,90%
ROA	5,98%	5,00%	3,10%	4,70%	5,00%

Table 5: financial performance of Canon (2014-2018)

Source: Canon's annual reports (2014-2018)

From the analysis of the corresponding data in the table it can be seen similar trend in revenues and gross profit, in particular in correspondence with a constant increase in 2014 and 2015 with a consequent and consistent decrease of both indices in the following year. 2017 marks a strong increase for both; stabilizing slightly lower in 2018. Cost of sales is between 50-44% of sales profits, which means that Canon has been able to slightly improve the efficiency in terms of cost of sales. Expenses for research and development compared to the revenues in sales are constant between 7.8- 8.8% with the minimum value in 2018. The ROE is stable in the years with the exception of 2016 when it undergoes a drastic reduction. The index that measures the return on invested capital (ROA) has its highest value in 2014 and its lowest value in 2016 (3.10%).

Company	Nikon			Fujifilm			Olympus		
Year	2016	2017	2018	2016	2017	2018	2016	2017	2018
Revenues (mln of yen)	841040	749273	717078	2460383	2322163	2433365	804578	748050	786497
Operating profit (mln of yen)	35226	774	56236	180626	172281	123329	104464	76487	81029
Net profit before tax and interest (mln of yen)	39546	3068	56257	182242	194775	197807	70800	62481	76665
Net profit (mln of yen)	29947	3967	34772	133495	147190	144244	62594	42810	57092
Operting cash flow (mln of yen)	107512	97342	125082	233479	288619	261152	48621	90194	95546
ROE	5,5%	0,7%	6,3%	5,5%	6,5%	6,8%	17,0%	11,3%	13,6%
ROA	3,0%	0,4%	3,3%	3,4%	3,8%	4,0%	6,0%	7,9%	5,9%

Table 6: financial performance of main competitors (2016-2018)

Source: Nikon, Fujifilm and Olympus annual reports (2016-2018)

In terms of comparing the indices of the competitors in the sector, it is interesting and useful to immediately analyse the revenues (in millions of yen). Canon has significantly higher profits than all competitors, despite all companies producing products aimed at both consumer and business customers. The only company that comes close to having similar revenues to Canon is Fujifilm. Although Fujifilm is the one that comes closest to Canon's sales size, the profitability in terms of invested capital is better both in 2017 and in 2018. This implies that Canon has been able to operate more efficiently than its competitor. Canon's ROE stands out to be better than its competitors Nikon and Fujifilm, but is lower, in all three years, than Olympus. Canon's ROA turns out to be better than Nikon's, but significantly lower than Olympus's.

6. Future scenarios

The previous analysis shows that Canon is clearly the leader of the digital camera sector thanks to its most valuable resources: the brand history, technical competences and property rights. Despite of its leader position, because of the upcoming decline of the digital camera market, the company has correctly diversified its brand portfolio and now it is strongly investing in high-potential businesses such as medical device and industrial sectors. So, the corporate governance about the allocation of resources among different business units has been certainly effective and proactive. This strategy has been pursued together with a cost reduction plan based on the automatization of the production process of digital cameras. This makes sense because lowering the manufacturing costs is a key success factor during the maturity stage and it will give soon extra resources for the new businesses. Therefore, the cost structure is sustainable and this is fundamental in order to maintain the leadership over time. Differentiating the core business of digital camera was necessary because of the market conditions, and Canon has been particularly able to understand the market trends and move in advance. However, this choice embeds some risks too. First, being a later entrant means having less experience about the market and weaker relationships with suppliers and distributors. This problem was overcome by making takeovers of existing companies with great competences and knowledge about the sectors and technologies. Second, making investments in businesses with a high growth rate, such as industrial equipment and network cameras, will require more and more financial resources in order to be competitive. This internal allocation of resources could be at the expense of the Canon's business unit which design and manufacture digital cameras. Customers will not certainly glad if the allocation of financial resources would damage the quality of the product or would slow down the innovation process concerning digital cameras. In conclusion, despite the business history of the company and the competitive advantage it gained during the last decades, Canon is still operating in a very challenging environment and its future will probably depend on the results of the new businesses.

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