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Kodak (A)

In February 2003, Daniel A. Carp, Kodak's chief executive officer and chairman, was reviewing 2002 data with the company's senior executives: film sales had dropped 5% from the already weak previous year and revenues were down 3%, sliding to $12.8 billion. The film industry was "under pressure unlike ever before", and Carp predicted a "fairly long downturn"[1] for traditional photography sales as more and more consumers were turning to digital cameras, which did not require film. The company had been investing heavily in digital imaging since the early 1980s, pioneering image-sensor technology in 1986 and entering the market with a variety of products during the 1990s.

In addition, Kodak was moving more of its manufacturing to China, where it could still boast film sales, and was planning to slash 2,200 jobs, or 3% of its work force, especially in the photo-finishing business. The picture for 2003 was not any brighter: Carp expected revenues to grow slightly to $13 billion and net income to be flat or down from the $770 million the company had earned in 2002.

A native of Wytheville, Virginia, Carp had graduated in management from MIT, and had begun his career at Kodak in 1970 as a statistical analyst. Since then he had held a variety of positions, including general manager of sales for Kodak Canada, general manager of the consumer electronics division, general manager of the European, African, and Middle Eastern regions in 1991, and president and chief operating officer in 1997. Carp was finally appointed CEO on January 1, 2000. After more than 30 years at the company, he realized this struggle was one of the toughest in the company's century-long history. How could he use digital imaging to revitalize Kodak?

Kodak's early days, 1880-1983

In 1880, after three years of photographic experiments, George Eastman, a young bank clerk, invented and patented a dry-plate formula and a machine for preparing large numbers of plates. In that same year, he leased the third floor of a building on State Street in Rochester, New York, and founded the Eastman Kodak Company. Although the company originally faced economic and technological challenges, it developed its first snapshot camera in 1888 and quickly became an American household name.

Professors Giovanni Gavetti and Rebecca Henderson and Research Associate Simona Giorgi prepared this case from published sources. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

In 1904 Eastman articulated the company's competitive philosophy: "Nothing is more important than the value of our name and the quality it stands for. We must make quality our fighting argument."[2] Based in Rochester, "the Kodak town", as the first ads stated, the company operated its own laundry service, a bank, a cafeteria, and a blacksmith, among other services. There wasn't much that Kodak didn't provide for its employees: indoor golf courses, bowling alleys, and movie theaters. Kodak ran most of these services until the 1980s.[3]

From the very beginning, the founder of the company realized that success came from a user-friendly product, and, as he succinctly described it, his objective was "to make the camera as convenient as the pencil."[4] Marketing was regarded as an essential tool for the company's success; film advertisements started as early as 1885. Eastman himself coined the slogan "You press the button, we do the rest" when he introduced the first Kodak camera in 1888. Eastman identified four basic principles for his business: mass production at low cost, international distribution, extensive advertising, and focus on the customer. To these principles he added the policy to foster growth and development through continuous research.

In 1884, Eastman replaced glass photographic plates with a roll of film, expressing a profound belief in "the future of the film business."[5] During the black-and-white film era, Kodak's leadership stemmed not as much from its technical leadership as from its marketing campaigns and its relationships with retailers (both for shelf space for its film rolls and for photo-finishing with Kodak's paper). Although some competitors, like Ilford in the United Kingdom, had succeeded in setting new standards of quality during the war years, the perceived quality of the existing products was so high that consumers were not willing to pay for an enhanced product.[6]

The idea that money came from consumables, not from hardware, emerged early: cameras were relatively cheap and film fueled the company's growth. Especially with the advent of color film, which required conspicuous investments in R&D, many firms lagged behind. Kodak had been involved with the development of color film since 1921 and had spent over $60 million in research up to 1957, reaching a total of $121 million only on color film research by 1963.[7] In addition, Kodak's photofinishing process had become the industry standard and most rival brands, though of excellent quality when properly processed, tended to fare badly in the typical photo shop.[8] From the early 1960s attempts to entry the market had become extremely rare, especially because the film composition's balance between chemical and physical properties and the know-how embedded in manufacturing made the creation of compatible products a very expensive and risky option.

Over time the belief that all the money came from film led the company to pay little attention to equipment. A Kodak executive commented, "No matter what they said, they were a film company. Equipment was ok as long as it drove consumables. If a camera helped sell more film, Kodak would sell it, but there was little concern about what kind of cameras consumers wanted, or how to make them better."[9]

The role played by film was so pivotal that most corporate power centered on Kodak Park's massive film-making plant, and historically CEOs came out of manufacturing jobs at the Park. They were alike in many ways: most of Kodak's senior management received the same training, attending MIT's Sloan School of Business as a sort of finishing academy. Since a mistake in the massive manufacturing process would cost thousands of dollars, and the company's profitability was steadily more than satisfactory, the company avoided anything risky or innovative and developed a set of "procedures and policies to maintain the status quo."[10]

Kodak reached $1 billion in sales in 1962. In the 1960s the company started to introduce new products (126 cameras in 1960s, 110 in the early 1970s) that moved beyond consumer photography to

medical imaging, and graphic arts. Most of these products exploited the traditional silver-halide technology and represented incremental improvements.

In 1969 Polaroid's basic patents on instant photography expired. Seven years later Kodak announced its first instant camera, and, thanks to its marketing and distribution capabilities, sold 16.5 million instant cameras between 1977 and 1985, severely threatening Polaroid. However, the company was forced to abandon this product line in 1985 because of a patent infringement suit by Polaroid. By 1976 Kodak controlled 90% of the film market and 85% of camera sales in the United States. Kodak's technological strengths and speed to market precluded the emergence of any serious competitor[11]. In 1981 Kodak's sales reached $10 billion, but growth began to decelerate thereafter because of increased competitive pressures, especially from the Japanese Fuji Photo Film Company. For an overview of the film market, see **exhibits 1, 2, 3, 4, 5** and **6**.

In 1981 Sony Corporation announced its plans to launch Mavica, a filmless digital camera that would display pictures on a television screen. Pictures could then be printed out on paper. Although CEO Colby Chandler contended that people "liked color prints" and that Kodak could quickly come out with its own digital camera, management became concerned over the longevity of silver-halide technology. A company's executive remembered, "It sent fear through the company." The reaction was, "Oh, my goodness, photography is dead."[12]

Diversification at Kodak, 1983 - 1993

Diversification in other businesses

Between 1983 and 1993 Kodak went through seven restructurings. Kodak acquired IBM's copier services business; Clinical Diagnostics, which produced in-vitro blood analyzers; Mass Memory, which sold Verbatim floppy disks; and other bioscience and lab research companies. In the late 1980s management looked further afield and chose to acquire Sterling Drug, a pharmaceutical company that sold popular products like Lysol and aspirin. The company believed that the pharmaceutical industry was related to its core "chemical" business: R&D played a pivotal role, and margins were high. Kodak paid $5.1 billion to acquire Sterling, of which $4.4 represented goodwill. Unfortunately, the stock price rose by only 2% from 1987 to 1993, and film market shares sunk by 5% between 1987 and 1992.[13]

Competition in the core imaging business: Fuji Photo Film Co.

"We were the imaging company of the world. We literally had no competition for so long, management hadn't become accustomed to it. Historically, if there was a competitor, Kodak would blow them away."

A former Kodak executive[14]

Fuji Photo Film Co., headquartered in Tokyo, was founded in 1934 as a comprehensive maker of photographic materials, producing film for movies and other applications, dry plates, and photo printing paper. In the 1960s Fuji started looking for alternatives to the development and production of silver-halide film and established a joint venture with Rank Xerox (Fuji Xerox).[15]

Fuji entered the U.S. market in 1965 as a private brand supplier. Although the company began to market film under its own brand name in 1972, its strategy consisted of following Kodak rather than attacking it directly. In 1976 Fuji was the first to introduce 400-speed color film, and more and more

photo-finishers switched to its photographic paper and other supplies, which were 20% cheaper than Kodak's. In a case study of Fuji and the Japanese market, M.F. Winters, a Kodak market analyst, warned senior executives about the company's eroding market share, but the report was ignored, because "they didn't believe the American public would buy another film."[16]

At the beginning of the 1980s, Fuji had revenues of $2.4 billion, only one-fifth of Kodak's, but its net income over the previous five years had grown an average of 40% annually, more than twice Kodak's rate. With a 70% film market share in Japan, Fuji's other businesses included cameras, carbonless copying paper, copiers, and videotapes. Fuji signaled its ambitions to capture U.S. market share in 1981, when it won the sponsorship as the official film of the 1984 Olympics. Kodak had balked at the cost of officially sponsoring film supplies, and Fuji, taking advantage of the opportunity, boosted its U.S. market share to 12%. Peter Palermo, who was then Kodak's senior vice president of imaging, observed, "It was December seventh [Pearl Harbor Day] at Kodak."[17]

An important element in Fuji's success was its highly productive research laboratories in Ashigara. In 1986 Fuji began selling a disposable camera, which became a big hit in Japan. Kodak claimed that its labs had already developed similar products early in the 1980s, but the company had failed to patent them, some said because of their inconsistency with the traditional razor-blade model.

By 1985, Fuji's share of the U.S. market had grown to 11%, while 3M's Scotch brand had a 3.7% share. New labels, eager to gain a foothold in this highly profitable film market, included Konica, Agfa, dozens of private-label varieties, and Indian, English and Korean brands. Consumers were learning that they could get high-quality pictures with cheaper film (film prices were generally 20% lower than Kodak's), and retailers devoted more shelf display to private labels since they could make higher margins on their own products. By the end of 1993 the worldwide film market was still dominated by Kodak, but Fuji had gained a 21% market share.

Kodak's exploration of digital imaging, 1983-1989

In 1983 CEO Colby Chandler created a photographic and information management division to explore new technologies, especially digital imaging. In addition, the company hired John White, who had worked in the upper ranks of the Pentagon before getting into the software business, to push Kodak forward in this exploratory phase. White said:

> Kodak wanted to get into the digital business, but they wanted to do it in their own way, from Rochester and largely with their own people. That meant it wasn't going to work. The difference between their traditional business and digital is so great. The tempo is different. The kind of skills you need are different. Kay [Whitmore, President] and Colby [Chandler, CEO] would tell you they wanted change, but they didn't want to force the pain on the organization.[18]

The exploration of a broad range of technologies (e.g., communication, electronics, computer science) responded to the company's need to shape the new imaging business. The CEO was still foreseeing a silver-halide-based future, but recognized the need to "blend new technologies, to meet the expectations of a growing customer base."[19] The basic idea sounded simple: "anticipate customers' needs, create the products they want, then market those products better and more cost effectively than anyone else in the industry." [20] From Chandler's perspective the new digital world could be overcome by applying the same formula defined by George Eastman at the beginning of the century: focus on the customer, extensive advertising, and mass production at low cost. Still, he conveyed a sense of urgency in formulating his strategy in the 1984 annual report:

> Kodak has historically evaluated future needs of a photographic market, conducted research to determine its size and growth potential, designed the goods, created manufacturing capacity and rolled out the new products. Today the pace of change has quickened. One Kodak strategy is to work with other major companies. Another proven Kodak approach is selective acquisition. Kodak is also increasing its involvement with several outstanding universities to conduct joint research in fields such as manufacturing productivity, biotechnology, microelectronics, and integrated circuitry.

In transforming itself, Kodak was abandoning its history as a stronghold of vertical integration. "One of the things we've learned is that one company can't do everything," Kodak president Kay R. Whitmore said. "We're prepared to acquire if it fits our strategic plan and gets us there sooner, or gives us a technical capacity we don't have in-house, or buys a market share that would be hard to build."[21]

In the mid-1980s Kodak built a research lab in Japan to study developments in electronics, in particular in digital cameras, because there was "a gut feeling that we ought to have a lab in the heartland of the consumer electronics revolution", said E.P. Przybylowicz, who operated as chief technical officer at the time. But it soon turned out to be "an impossible situation": the research lab had been put on a pay-as-you-go basis, and that meant that scientists had to look for financial support from individual business units, rather than from an overall corporate strategy.

The exploration of new technologies led Kodak to develop the 8mm Kodakvision video system together with TDK and Mitsushita; to acquire other companies, like the Datatape division of Bell and Howell, which manufactured high technology analog and digital recording equipment; and to devote internal resources to research. Relative to internal R&D, Chandler's stated strategy was to "continue support to extensive research in chemistry, optics, and increasingly in electronics."[22] But some executives still found it difficult to believe in something that was not as profitable as traditional film. "We're moving into an information-based company", Leo J. Thomas, senior vice president and director of Kodak research, stated, "[but] it's very hard to find anything [with profit margins] like color photography that is legal."[23]

In 1986 Kodak launched the world's first electronic image sensor with 1.4 million pixels (or picture elements), and the following year the electronic photography division was established. By 1989 Kodak had introduced more than 50 products that involved electronic image capture or conversion, such as printers and scanners (including products like Business Imaging Systems' Imagelink scanner 9000, Printer Products' XL 7700 digital continuous tone printer, Copy Products' Ektaprint 1392 printer, professional Photography's Premier image enhancement system and Motion Picture and Television's HDTV projection system). Within the information sector, four centers of excellence were established to develop image acquisition, storage system, software, and printer products. The same year the CEO declared his intent for the company to "be the world's best in chemical and electronic imaging" by "exploring and defining the best ways to manage the convergence of conventional imaging science with electronics."[24]

Although the company had been the first to introduce an image sensor, one of the core elements of a digital camera, the first widely announced digital product was the Photo CD. Kodak wanted to shape the new market creating the "film-based digital imaging."[25]

"Film-based digital imaging", 1990-1993

The Photo CD, developed in collaboration with Phillips, was designed to combine "the best of the photographic medium with the best attributes of electronic imaging."[26] The Photo CD started as a

blank compact disc. A roll of film could be taken to a photofinisher, and images, rather than being printed, were then stored on the disc. Images could then be viewed on a TV screen with a special Photo CD player or on a computer screen with a CD-ROM. The project was expected to be a $600 million business by 1997 with $100 million earnings from operations, but there was little evidence that consumers were willing to pay $500 for a player that plugged into a TV, plus $20 per disc[27].

From the company's perspective new products had to rely on a hybrid film/electronic imaging technology because "for the foreseeable future" silver-halide technology was going to provide the highest-quality images attainable at the lowest price. But managing the alliance of chemical-based and electronic image was also a way to maintain leadership by shaping a Kodak-friendly new environment. Kay Whitmore, who had become chief executive officer in 1990, commented, "As this company did with black-and-white and color, we intend to set the standards and lead the way in film-based digital imaging."[28]

This blending of digital features and traditional photography allowed film to still play a pivotal role. Kodak planned to sell new hardware products improved by digital features, to license technology to computer manufacturers, to have more prints from discs at photofinishers, and to apply the knowledge acquired in digital imaging to the motion picture business and commercial products. But money still had to come from consumables, that is photographic film and paper, just "adding the flexibility offered by electronics."[29]

The first professional digital camera was introduced in 1991, but in Kodak's Annual Reports, management presented the Photo CD as the company's innovative offering. Unfortunately, the Photo CD did not prove to be a success: it had been targeted to the wrong market, the consumer segment, even though its invention team had suggested that its real potential lay in the commercial market. Scott Brownstein, who led the Photo CD team, said that senior managers at the time wanted a quick hit and did not "understand our real vision or strategy."[30] Brownstein and his group were looking for alliances with computer companies to make CD-ROMs compatible with the Photo CD, but when senior executives managed to get a meeting with Bill Gates, he remembered the lack of interest of Whitmore, who apparently fell asleep.[31] Later, when the Photo CD team managed to deal with the computer companies, they still had problems explaining the details to Whitmore. An industry observer commented:

> Kodak's strategy for digital imaging has been way out of focus for years. Product development was uncoordinated, and marketing was ineffectual. The Photo CD, a compact disc that stores photographs for viewing on TV screens or PC monitors, was a flop as a consumer product. Kodak introduced it in 1992 to consumers who didn't like the prices: $500 for a player that plugs into a TV, plus $20 per disk. And the computer industry adopted its software algorithms as the standard for manipulating color and images on CD-ROM. How did Kodak miss that? The entire digital revolution has been a trickle-down affair.[32]

On August 6, 1993, Kodak announced that CEO Kay Whitmore would step down. The members of the board were looking for a chief executive with "exceptional drive and energy" and in late 1993 they selected George M.C. Fisher, former CEO of Motorola. The first outsider ever to run the 116-year-old Kodak, Fisher, after receiving his Ph.D. in applied mathematics, had apprenticed at AT&T's Bell Labs, where he did work related to photography, such as conveying and compressing images. Fisher believed that Kodak was a company built on "imaging," not only on film, and that opportunities for growth could come from a focus on the core business and the exploitation of new digital technologies.

Back to the core business

Fisher's first step was to divest the company's health segment, with the exception of the health sciences unit, which included mostly X-ray film and other diagnostic imaging hardware and consumables. Kodak sold Sterling Drug, L&F Products, and Clinical Diagnostics in less than eight months, collecting $7.9 billion that it used largely to pay off debt. In December 1993 the company decided to spin off Eastman Chemical, which had been formed in 1920 to supply raw materials for Kodak's photographic business, but by 1993 only 8% of its sales derived from Kodak. As a result, the balance sheet improved, and S&P's rating on Kodak's debt raised from BBB+ to A+. In completing the divesture of the company's unrelated businesses, Fisher demonstrated his confidence in the future of the imaging segment, after a decade of pessimism. "People began to think electronics was going to take over the photography business. And if you are looking at the world from within the photography business, that would be a very scary event. But the fact of the matter is, I grew up in the electronics business and I looked at the photography and imaging business from the electronics side and it's not such a scary event. Electronics will add a lot to photography and a lot to imaging."[33]

Growing in the film business: Fisher's legacy in China

Fisher believed that scenarios about the future of silver-halide photography had been too pessimistic and that emerging markets, particularly China, represented an overlooked growth opportunity. He commented, "I think maybe people didn't properly understand that the world is a lot bigger than the United States and that something fundamental had changed in the last five years. About four billion people are now accessible as a market."[34]

Kodak had begun its push into China in 1993, and when Fisher joined Kodak, the company was third in film share and fourth in paper share, with only 30 employees. From his days at Motorola Fisher had established enormous credibility with officials in Beijing: from 1994 to 1997 Kodak negotiated with local officials and in March 1998 finally reached a deal that left Kodak committing $1.2 billion and that led to the creation of two joint ventures with the Chinese government. To improve its cost structure, by 2002 Kodak had moved facilities to China that manufactured digital, conventional, and single-use cameras, kiosks, and mini-labs. In addition to building its manufacturing presence, Kodak focused on creating a network of retail outlets that helped sales of film rolls. By the beginning of 2002 Kodak had 63% of the Chinese retail film market, with 7,000 Kodak Express film stores. An industry expert who toured Kodak's operations in China in 2000 observed, "Kodak's China operations represent the best of what an American industrial company can be in the emerging markets, in our opinion. It appears a true jewel for Kodak long term, and one that Mr. Fisher deserves full credit for discovering."[35] **Exhibit 19** reports on the company's retail presence in China.

Digital imaging in Fisher's era, 1993 – 1997

By the time Fisher arrived at Kodak, the company had already spent $5 billion on digital imaging R&D, but little had emerged from the labs. Product development and sales efforts were scattered over more than a dozen divisions, and at one point the company was engaged in developing 23 different digital scanner projects[36]. In 1994 Fisher separated the company's embryonic digital imaging operations from its traditional silver-halide photographic division, and created a digital and applied imaging division, in order to centralize the company's efforts in the area while building on Kodak's core capabilities in imaging technology and color science. Carl E. Gustin Jr., formerly with Digital Equipment Corporation and Apple Computer, was appointed general manager, and John Scully, former CEO of Apple Computer, was hired as a marketing and strategy consultant. In February

Fisher appointed Harry Kavetas, a former IBM executive credited with rejuvenating Big Blue's credit unit, as Kodak's chief financial officer.

Fisher saw considerable potential in the company's electronic imaging patent portfolio: he quickly pushed the introduction of the digital print station (a product sold to retailers that allowed customers to digitize their photos and to use them in many ways), new models of digital cameras, and thermal printers and paper to make prints from the cameras once the images were loaded into a personal computer. Fisher was determined to bring to market all those digital programs that had been languishing in the labs:

> Mr. Fisher unveiled a huge reorganization that would point Kodak back to the imaging business started by George Eastman in 1880. Yet, instead of dwelling on the future of the silver-halide photographic technology that has made Kodak the world's biggest photographic company, he talked mainly about digital imaging - a business that makes up a small fraction of Kodak's sales and has proved a consistent loss-maker.[37]

When Fisher joined the company he stressed that Kodak would focus on "profitable participation in the five links of the imaging chain: image capture, processing, storage, output, and delivery of images for people and machines anywhere."[38] In particular, Fisher, who had already turned Motorola into one of the world's finest manufacturers of pagers and cell phones, believed that "Kodak could be successful in the equipment business" because it possessed the capabilities to "do much besides make film."[39] His first step was to re-engineer the company from top to bottom, and "ten teams of senior managers - two of them led by Mr. Fisher - were charged with rethinking everything from product development to how to expand Kodak's markets:"[40]

> He wanted a 50% reduction in the cost of quality in two years. Each business would be required to calculate its customer satisfaction index and to show improvements. Every division had three years to reduce defects and improve reliability. Cycle times on everything from routine paperwork to manufacturing goods were to be improved by a factor of ten over three years.[41]

In his early days Fisher spent considerable time in meetings with Bill Gates and other leaders of the computer industry, with the aim of forming alliances and developing new products, because he thought that profitability on the hardware side could only come with the help of the computer and electronics industry. He hoped to "fill in the blanks" of Kodak's digital product line, which was marked by the initial failure of its consumer Photo CD product and digital camera for professionals, priced at $29,000.[42] Fisher believed that to be a winner in digital imaging Kodak had to become a high tech-company: "[Fisher] has devoted substantial energy to making Kodak more like Motorola, capable of producing new state-of-the-art products every few months. Company factories are churning out an impressive array of digital cameras, scanners, and other devices at a breakneck clip."[43]

But competition in the market for digital cameras was tough: when Kodak introduced the DC40 in 1995, there were two other models under $1,000, but by 1996 there were 25 different brands in the category. And not all executives believed in Fisher's new vision of the company. In fact competition from Hewlett Packard, Canon, Fuji and others was not the only difficulty that Fisher had to face. As one industry executive commented:

> The old-line manufacturing culture continues to impede Fisher's efforts to turn Kodak into a high-tech growth company. Fisher has been able to change the culture at the very top. But he hasn't been able to change the huge mass of middle managers, and they just don't understand this [digital] world.[44]

Fisher, who was used to dissent and open discussion in Motorola, where "they argued like cats and dogs, loudly, sometimes"[45], realized that Kodak executives tended to be very polite and things looked much easier than they actually were. Kodak's employees didn't like confrontations and venerated authority: "It was so hierarchically oriented that everybody looked to the guy above him for what needed to be done."[46] Fisher tried to introduce the Motorola-style of open discussion, but change was difficult. The razor-blade culture in Kodak was so deeply ingrained that even disposable cameras had been considered almost sacrilegious.

At an analysts' meeting in late 1997, after three quarters of sluggish sales and profits, Fisher admitted that 60% of the company's losses were "costs linked to digital cameras, scanners, thermal printers, writeable CDs and other products"[47] and announced a reversal of his hardware-based digital strategy:

> We don't intend to be in the film business, in the computer business, in the digital imaging business. We're in the picture business. And our intention is to use whatever technology is available to us to truly help people do more with their pictures. Electronic imaging will not cannibalize film. One of the mistakes we at Kodak have made is that we've tried to do it all. We do not have to pursue all aspects of the digital opportunity and we see our opportunity in the output and service side.[48]

Analysts commented:

> When the new management was brought on 3 years ago, one of its strategies for growth was to focus more on the hardware. This strategy has not been successful, considering the losses on digital cameras. Kodak continues to derive most of its profits from business units where more than 50% of revenue is generated from consumables and where the company has more than 50% market share.[49]

Toward a fully digital world, 1998 – 2003

Fisher established a new vision for the company's role in the digital age, a "network and consumables"–based business model:

> We see a networked world in making, taking and processing pictures. We will stick ourselves in the middle of that world with services that people are willing to pay for, like creating photo albums online or simply sending photos from point A to point B. Or they'll use one of our 13,000 kiosks. People without computers can go to a kiosk and send photos halfway around the world. We will always sell film, paper and chemicals. But in the future, we will let people take pictures and scan them in digital form, and we will make money on the different media (CDs or the Internet, for example) or material for output - inkjet paper, thermal papers, and traditional silver halide paper.[50]

Fisher developed the idea of a "horizontal company", based on the outsourcing of most digital photographic equipment and on alliances (e.g., with Intel): "Traditionally, our business is chemically based, and we do everything. In the digital world, it is much more important to pick out horizontal layers where you have distinctive capabilities. In the computer world, one company specializes in microprocessors, one in monitors, and another in disk drives. No one company does it all."[51]

But on the film side, in 1998 the company was caught off guard by Fuji, which deeply cut prices to grab U.S. market share, where Kodak still enjoyed the highest margins. In one year Kodak lost more than four points in market share: Fisher observed that Fuji was "literally buying presence in this country, buying customers in this country, selling film at unbelievably low price because they could

afford it and because they had an infinite source of money coming out of a protected market in Japan."[52] As a result of this price war, by the end of 1999 the company had to cut $1.2 billion in costs and 19,900 jobs, or about one-fifth of its payroll, the most severe cutback ever at Kodak.

In January 2000, one year before his contract was to expire, Fisher stepped down as chairman and handed over the post to a veteran insider, company president Daniel A. Carp, who had made his name as a brand builder rather than a technology guy. From Fisher, Carp inherited the idea of the horizontal company and the "network and consumables"–based business model:

> We see digitization in creating a film and a photo-finishing aftermarket that should fuel an explosion of pictures and use of digital and 35mm technology. At its core, Kodak's digital strategy is to create a profitable bridge between the old and new worlds of photography. Even as it hopes to jump-start sales of digital cameras, the company wants to transfer as many of its customers' traditional snapshots as possible to digital form. It figures there's big money to be made uploading traditional pictures onto the Internet and in expanding its share of the market for reprints, inkjet paper, and photo-editing software.[53]

Between 1999 and 2000, the digital strategy pursued by Fisher and Carp led the company to achieve a number two in digital cameras behind Sony, with a 25% market share, a running print-on-demand website, and promising joint ventures to popularize new distribution channels such as digital photo kiosks and the Internet.[54] The company was gradually changing its focus: "Just as the early Kodak pursued the holy trinity of film, paper and chemicals, and dominated all three, the new Kodak worships the digital trinity of image capture (cameras), services (online photo manipulation) and image output (digital kiosks, inkjet printers, paper and inks).[55]

On the output side, the Kodak network of 19,000 Picture Maker kiosks at retail stores was turning out to be quite successful. At $15,000 each, Carp said they were highly profitable and accounted for $200 million in sales; "with 95% of customers who used them coming back repeatedly, they produced steady photo paper sales."[56] Kodak also engaged with Hewlett Packard in an ongoing battle for the printing segment, investing a large portion of its R&D budget in inkjet printers, which drove sales of high-margin inkjet consumables and specialized paper.[57]

In fall 2000 another round of corporate restructuring brought digital and applied imaging and consumer imaging under one organization, a move that was expected to end the internal war between the film and the digital segments.[58] But in 2001 Kodak was still losing $60 on every digital camera it sold.[59] Still, Carp continued to invest in digital imaging, and the company actually boosted its advertising spending.[60] Kodak's commitment to building and consolidating its brand could be traced back to one of George Eastman's basic formulas for success: "advertise the product." In the 1970s the company had even moved to TV, sponsoring all-American programs like "The Adventures of Ozzie and Harriet" and "The Ed Sullivan show", and by 1995 it was using 177 advertising agencies (consolidated into four accounts by Fisher the following year).[61] In 2001 the company was trying to develop a more integrated marketing effort and message to the customer, with its "Where it all clicks" theme, and consumer imaging, digital and applied imaging and Kodak.com were all going to market with one ad campaign.[62]

The company also invested a considerable portion of its R&D dollars developing software for image manipulation, to enhance what could be done on a computer to a digital picture and at a retail store to traditional film. In October 2002 it launched in the Midwest the first mass-market product for digital film processing. With this new software, film was still developed traditionally, but instead of shining light through each negative onto photographic paper to create an image, digital processing scanned each negative, converting its image to a string of ones and zeros stored in a computer's memory. The computer then analyzed each image, looking for areas that had been exposed to too

much or too little light. Using laser to paint each image pixel by pixel, the computer filled in light where needed and cut back on light where a flashbulb had supplied too much in the original negative. Carp commented, "This is the most important innovation for us since color. Using digital technology to enhance photos consumers take with existing analog cameras is an extension of Kodak's basic strategy of making it easier to take pictures."[63]

At the 2002 Kodak annual meeting, Carp outlined four strategic paths to move Kodak into the new millennium:[64]

- Expand the benefits of film. Kodak aimed to grow its share in the worldwide market by offering premium products (e.g., the Max HQ or the Max Versatility products), by leveraging its distribution, and by increasing its exposure through more targeted marketing campaigns. Kodak pricing of the low end of its film portfolio had narrowed over time, after the price war with Fuji between 1998 and 1999;

- Drive image output in all forms, to achieve higher margins at retailers. The company was planning the introduction of the Perfect Touch premium processing system and the expansion of its portfolio of digital mini-labs;

- Simplify the digital photo experience for consumers, with an emphasis on products such as the EasyShare digital camera platform, Picture Maker kiosks, and Picture CDs;

- Grow in emerging markets, in particular China and India, where the company already operated thousands of Kodak Express Stores.

Although the company optimistically outlined a scenario in 2002 in which the consumer digital business would break even in late 2003, by January 2003 digital cameras had not yet boosted the bottom line, while prices were plummeting: fourth quarter earnings were worse than analysts expected, and the company announced new layoffs.[65] However, despite financial problems, the company maintained control over a majority of photofinishing transactions in the United States, and had 15% of the U.S. digital camera market.[66] See **exhibits 18** and **20** for financial information about Kodak.

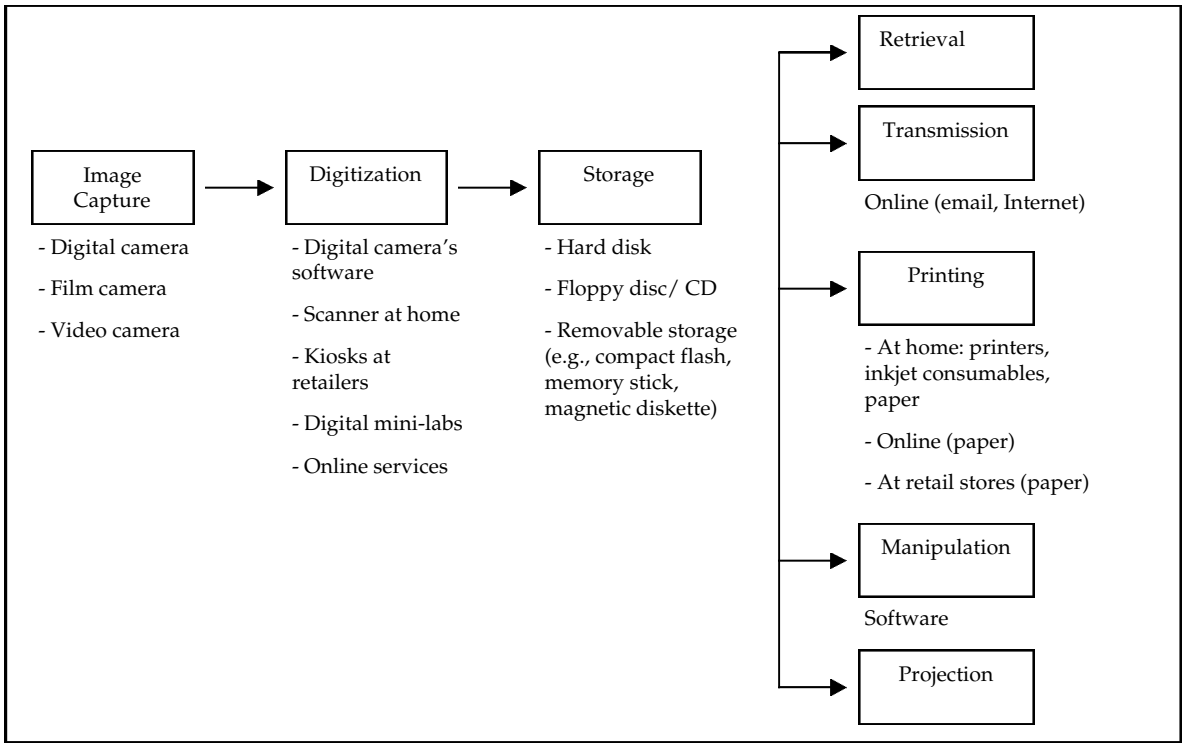
The Digital Imaging Industry

The digital imaging market began to expand in 1993 and 1994, with the introduction of a host of new products. In August 1994, there were 22 different models of filmless cameras on the market. One year later, only three models were priced under $1,000, but by 1996 25 different brands joined the category. In these early years there was a great deal of uncertainty about how market segments for digital cameras would evolve. Based upon quality and price, the market was generally separated into three levels. On the high end was studio photography, including magazine and catalog publishers, commercial photography studios, and in-house studios at corporations, hospitals, and government agencies. Leaf was an early leader in the studio camera market, but it quickly faced competition from companies such as Dicomed, Kanimage, Sony, and Kodak. In the mid-range segment, customers included photojournalists and professional photographers, who required a slightly lower resolution. This segment was very crowded, but Fuji and Kodak both had fairly popular offerings. The low end of the market included both consumer and business applications, such as real estate, insurance, and advertising as well as images displayed on computer screens or web sites. The first offering in the low-end market was Apple's QuickTake 100, priced at $749 in early 1994. Major competitors that followed included Logitech's Pixtura and Kodak's DC-40. All three cameras used an image sensor developed by Kodak in 1986.

Other digital products originally included 35 mm scanners, initially offered by Nikon, Polaroid, and Minolta; image-editing, dominated by Adobe's Photoshop; and printers, where the first players were Fuji, which offered a thermo-autochrome printer that garnered a great deal of attention, Epson, which had a color ink jet printer for the low-end priced under $700, and Kodak, which offered a widely acclaimed dye sublimation printer. It was difficult to determine clear leaders in each category, however.

By the end of the 1990s, the digital imaging industry was a portfolio of four major sub-markets, each with its own competitive dynamics: digital cameras, home printing, online services, and retail solutions (kiosks and mini-labs). The process of acquiring, digitizing, storing, printing, manipulating, transmitting, retrieving and projecting digital images had evolved over time in terms of ease of use and availability of options (**Figure A**).

Figure A The Digital Imaging Chain



Source: Casewriter.

The digital camera markets began to expand rapidly in the late 1990s, and with 6 million units sold in 2001 (almost a 50% increase over year 2000) volumes were approaching early mass-market penetration, especially in the United States, where the installed base had reached 13 million households, 12.5% of the total. Digital cameras sales in September 2002 had increased 60% over the previous year, with a plummeting average price of $350. Although competition in the field was strong and largely based on price, features, and functionality (in an IDC study conducted in 2001, consumers were found to have relatively low brand awareness in digital cameras), the market was consolidating into a few major vendors like Sony, Kodak, Olympus, and Hewlett Packard. True profitability remained elusive for most, and since a lean cost structure played a pivotal role, vendors

were moving manufacturing infrastructures to China. **Exhibits 7, 8, 9, 10, 11** and **12** show data about the traditional and digital cameras market.

In the film world, all images captured were processed at retail locations, however, in the digital world, users had multiple photo processing alternatives. Printing efforts focused on home/office printing, Internet photo service providers, and retail photofinishing. As concerned home printing, industry experts estimated that in 2002 almost 80% of digital prints were done in the office or at home, but that by 2005 home printing would decline to a 65% of all digital prints.[67] Four vendors dominated the inkjet-printers market: Hewlett Packard, Lexmark, Epson, and Canon. Much more profitable, however, was the consumable-side of the business: inkjet consumables, where Hewlett Packard enjoyed the lion's share, while Kodak had a small role thanks to its relationship with Lexmark, and high-grade inkjet paper. Hewlett Packard and Kodak dominated the specialty paper market with estimated EBIT margins of 25% after retail mark-up.

In 2000 more than a hundred companies were competing in online services, which mainly consisted of digitization, photo-finishing and storage, but by the end of 2002 three major players were still in the market: Kodak/Ofoto, Shutterfly, and Fuji. For instance, Ofoto, founded in 1999 and acquired two years later by Kodak, provided free online storage of photos and charged a fee for prints, enlargements, photo cards, albums, frames, and other photo-related merchandise, which were then delivered to the customers' doorstep. In addition, for less than $4 Ofoto's clients could have their traditional silver-halide pictures digitized and posted online. In 2002, online photo-finishing services accounted for 10% of all digital prints.[68] Prices had gone down with the elimination of service fees, but industry experts expected the model to be profitable in a few years since there was no retail markup. See **exhibits 13, 14** and **15** for more details on printing and photofinishing.

According to a report by International Data Corporation, in 2001 36% of the 31 million images captured were printed and 15% of them were processed at retailers, although digital mini-labs and kiosks were expected to capture the lion's share in the future.[69] Over the previous two decades, the photo processing industry had gone through dramatic changes. Early on, retailers had formed regional wholesale labs to sustain film processing and over the 1980s and the 1990s Kodak and Fuji promoted a massive consolidation that endowed the two players with almost total control of the market. Concurrently, new photo-processing units, designed to fit into retailers' shops, enabled local service of 24-hour and then one-hour processing. As a result, the amount of film sent to wholesale labs for processing declined.

Retailers offered two main processing solutions, mini-labs and kiosks, which were introduced in the mid-1990s to bridge between traditional inputs and new digital opportunities. With the advent of digital imaging, retailers turned to digital kiosks, which eliminated scanners from the system, and digital mini-labs, which could print digital files as easily and at the same quality as they could print silver-halide based photos. In addition, both digital mini-labs and kiosks provided for digital uploads from CDs, Zip discs, floppies, DVDs, and numerous flash cards. Once digitized, images could be archived on CDs or other media. The digital mini-labs market, which represented in 2002 almost 15% of the total mini-lab installed base, was dominated by Fuji with its Frontier products. Fuji, with more than 5,000 labs in place, had 60% of the U.S. digital mini-lab market and had signed deals to install machines in 2,500 Wal-Mart and about 800 Walgreen outlets. The two chains handled about 40% of the U.S. photo-processing market. Kodak lagged behind with about 100 digital mini-labs in service, because its 1997 agreement with Gretag ended in 2002 with the German imaging company's filing for bankruptcy. In the same year, Kodak joined forces with Noritsu Koki to close the gap, projecting to sell 1,000 mini-labs by the end of 2003.[70] **Exhibit 16** shows the evolution of the installed base of mini-labs and kiosks in the United States, while **exhibit 17** focuses on the competitive dynamics of the retail mini-lab market.

The Rochester-based company predominated in the offering of kiosks, with its 34,000 Picture Makers, providing retailers with a modular solution that consisted of three stations: Picture Maker Order Station, Digital Station, and Print Station. Each of these stations could be purchased individually and retailers could upgrade from one to the next without problems of compatibility.[71]

Appendix A presents an overview of Kodak's competitors in digital imaging.

Exhibit 1 U.S. Film Sales, 1983 - 2000 (in millions of rolls)

	35mm	APS	110/126	Disc	Instant	Other	Total Film
1983	224	-	177	82	95	16	594
1984	276	-	75	169	90	-	610
1985	339	-	74	165	80	9	667
1986	375	-	107	116	85	11	694
1987	430	-	117	124	93	17	781
1988	493	-	126	87	89	16	811
1989	567	-	117	62	92	6	843
1990	601	-	105	47	89	6	848
1991	629	-	83	28	89	10	837
1992	631	-	65	28	90	7	821
1993	687	-	61	15	91	6	860
1994	707	-	57	9	87	5	864
1995	704	-	50	6	88	19	867
1996	761	5	45	5	88	4	908
1997	744	30	60	3	90	2	928
1998	788	55	37	3	86	3	972
1999	856	80	23	0.3	80	5	1044
2000	844	104	21	0.1	84	3	1055

Source: Adapted from PMA Marketing Research.

Exhibit 2 Worldwide Film Revenues, 1994 - 2006E ($ millions)

	Color Negative	Color Reversal	Black and White
1994	11,600	980	860
1995	12,340	915	720
1996	13,530	905	640
1997	15,580	840	600
1998	15,265	835	560
1999	15,835	815	550
2000	15,897	810	550
2001	15,960	805	549
2002	15,618	784	538
2003E	15,231	764	527
2004E	14,853	744	516
2005E	14,463	724	504
2006E	14,082	705	493

Source: Adapted from Salomon Smith Barney, 2002

Exhibit 3 Worldwide Film Market Share, 1990 - 2002E (unit market share, in percent)

	Fuji	Kodak	Konica	Agfa	Others
1990	15	60	7	15	3
1991	17	58	7	15	3
1992	19	56	7	15	3
1993	21	54	7	15	3
1994	23	52	7	15	3
1995	25	50	7	15	3
1996	27	48	7	15	3
1997	29	46	7	15	3
1998	31	42	7	15	5
1999	33	40	7	15	5
2000	35	38	7	15	5
2001	37	36	7	15	5
2002E	39	34	7	15	5

Source: Adapted from Merrill Lynch and PhotoMarket

Exhibit 4 U.S. Film Revenues Share by Channel, 2000 - 2003E (in percent)

	2000	2001	2002	2003E
FDM*				
EK's share	68.2	65.2	65	64
Share of total market	44.7	44.2	45	45
Wal-Mart				
EK's share	53.3	50.7	51.4	29.9
Share of total market	28.3	29	29.9	29.7
Costco				
EK's share	61.5	100	100	100
Share of total market	7	6.8	7	7
Sam's Warehouse				
EK's share	68.5	100	100	91.6
Share of total market	6	6	5.4	5.5
Other warehouse				
EK's share	63	62	62.3	62.4
Share of total market	4	4	3	3
Specialty retailers				
EK's share	63	60.3	60.1	60.1
Share of total market	10	10	9.7	9.8

* Food, Drug, and Mass Merchandising Channel

Source: Adapted from Lehman Brothers, 2003

Exhibit 5 Film Revenues Change in the U.S. Food, Drug, and Mass Merchandising Channel, 2001 - 2002 (in percent)

	February-01*	March-01	April-02	May-02	June-02
Kodak	-12.8	-15.3	-19.8	-16.2	-15.4
Fuji	23.6	14.4	11.5	8.3	8.2
Polaroid	-15.5	-13.4	-14.2	-9.5	-21.1
Private Label	4.7	16.0	-4.3	-6.5	-9.8
Others	-42.8	-49.0	-53.7	-25.6	41.2

* Change in revenues over the 4 weeks ended February 2001, March 2001, April 2002, May 2002, and June 2002.

Source: Adapted from Morgan Stanley, July 2002

Exhibit 6 Average Price per Film Roll Change in the U.S. Food, Drug, and Mass Merchandising Channel, 2001 - 2002 (in percent)

	February-01*	March-01	April-02	May-02	June-02
Kodak	2.3	0.7	-1.4	-2.5	-1.7
Fuji	-2.7	-1.0	-2.0	-3.2	-0.4
Polaroid	-1.3	-6.4	-9.4	-14.6	-8.0
Private Label	-9.5	-5.4	-8.7	-12.2	-8.2
Others	-21.5	0.0	26.5	11.5	13.6

* Change in average price per roll over the 4 weeks ended February 2001, March 2001, April 2002, May 2002, and June 2002.

Source: Adapted from Morgan Stanley, July 2002

Exhibit 7 U.S. Camera Sales, 1983 - 2000 (in million units)

	35mm	Advanced Photo Sys.	110/126	Disc	Instant	OTU**	Other	Traditional tot.	Digital
1983	4.5	0	3.5	5.1	4	0	0.7	*17.8*	
1984	5.4	0	3.2	4.6	3.5	0	0.3	*17*	
1985	6.5	0	3.2	4.8	3	0	0.3	*17.8*	
1986	6.9	0	3.1	3	3.2	0	0.2	*16.4*	
1987	8	0	6	1.8	2.7	0	0.2	*18.7*	
1988	9	0	5.6	1	2.1	3	0.1	*17.8*	
1989	9.9	0	4.7	0.6	1.9	6	0.1	*17.2*	
1990	10.1	0	3.7	0.2	1.6	9	0	*15.6*	
1991	10.3	0	3	0.1	2.1	14	0	*15.5*	
1992	10.7	0	2.4	0	2.2	21.5	0.1	*15.4*	
1993	10.8	0	2.4	0	2.5	32.2	0.1	*15.8*	
1994	10.7	0	2.5	0	2.2	43.3	0.1	*15.5*	
1995	10.8	0	2.1	0	1.8	54.1	0.3	*15*	0.2
1996	10.6	1.1	1.6	0	1.7	71.7	0.2	*15.1*	0.4
1997	9.6	2.4	1.5	0	2	88.3	0.1	*15.6*	0.7
1998	9.9	3.1	1.3	0	1.9	110	0.1	*16.4*	1.2
1999	10.8	3.3	1.2	0	2.5	138	0.04	*17.8*	2.2
2000	11.4	3.3	0.8	0	4.2	161.8	0.02	*19.7*	4.5

Source: Adapted from PMA Marketing Association

Exhibit 8 Worldwide Camera Sales, 1997 - 2004E ($ in millions)

	1997	1998	1999	2000	2001	2002E	2003E	2004E
Digital	1,210	2,565	3,915	7,236	8,362	10,242	11,253	11,862
Traditional	16,000	16,250	16,750	14,740	14,070	12,864	11,539	9,809
Instant	413	450	788	1,013	962	904	841	774

Source: Adapted from Salomon Smith Barney 2003

Exhibit 9 Digital cameras sales by region, 1995 - 2000 (in millions of units)

	1995	1996	1997	1998	1999	2000
United States	0.2	0.4	0.7	1.2	2.2	4.5
Japan	0.1	0.5	1.0	1.5	1.8	3.6
Europe	0.0	0.1	0.4	0.6	1.1	2.3
Rest of the world	0.0	0.0	0.4	0.5	0.6	0.8

Source: Adapted from Salomon Smith Barney, 2001

Exhibit 10 U.S. Digital camera market share, 1998-2002 (units share)

	1998	1999	2000	2001	2002
Sony	59%	53%	28%	24%	34%
Kodak	17%	27%	13%	15%	13%
Olympus	9%	9%	18%	15%	20%
HP	5%	3%	4%	14%	5%
Fuji	1%	2%	5%	3%	4%
Canon	2%	1%	7%	5%	9%
Nikon	NA	NA	4%	4%	4%
Other	5%	6%	21%	20%	11%

Source: Adapted from Credit Suisse First Boston, 2002

Exhibit 11 Digital Camera Average Selling Price by mega-pixel resolution, 2000 - 2006E (in $)

	2000	2001	2002E	2003E	2004E	2005E	2006E
1MP	412	263	212	156	121	101	91
2MP	590	442	315	250	218	194	181
3MP	865	688	396	323	265	242	226
4MP	-	854	576	402	336	301	283
5MP	-	1,176	986	798	673	596	553
6+MP	-	-	1,201	1,002	833	754	668

Source: Adapted from IDC and Salomon Smith Barney, 2002

Exhibit 12 Worldwide Photography, Film, Processing, and Output Revenues ($ in millions)

	2000	2001	2002E	2003E	2004E	2005E	2006E
Cameras	22,988	23,394	24,101	23,615	22,443	20,556	19,373
Digital cameras	7,236	8,362	10,242	11,235	11,862	12,596	13,222
Traditional cameras	14,740	14,070	12,864	11,539	9,808	7,356	5,517
Instant cameras	1,013	962	904	841	774	704	634
Film	17,257	17,314	16,940	16,522	16,113	15,691	15,280
Paper	4,304	4,391	4,549	4,818	5,292	6,081	6,900
Paper	4,299	4,381	4,410	4,417	4,596	4,792	5,112
CD's	5	10	93	185	364	674	935
DVD's	0	0	46	163	332	615	853
Photofinishing	*36,545*	*37,389*	*36,939*	*35,936*	*34,996*	*34,114*	*33,290*
Amateur	27,244	27,890	27,725	27,183	26,680	26,214	25,785
Professional	9,301	9,499	9,214	8,753	8,316	7,900	7,505

Source: Adapted from Salomon Smith Barney, 2003

Exhibit 13 Worldwide Photofinishing Market Share by Region, 1995 - 2006E (in percent)

	1995	1996	1997	1998	1999	2000	2001	2002	2003E	2004E	2005E	2006E
United States	36.1	35.1	32.9	34.1	34.9	35	35	35.1	35	34.7	34.3	33.5
Japan	15.6	15.8	14.6	14	13.4	13.1	12.7	12.3	11.8	11.4	11	10.7
W. Europe	30.2	30.1	29	29	28.8	28.9	29.2	29.3	29.6	30	30.4	31
Other	18.1	19	23.5	22.9	22.9	23	23.1	23.3	23.6	23.9	24.3	24.8

Source: adapted from Photofinishing News and Salomon Smith Barney, 2002

Exhibit 14 Worldwide Digital and Film Image Capture and Print Volume, 2000 - 2006 (millions of units)

	2000	2001	2002	2003	2004	2005	2006	CAGR (%)
Digital								
Digital images captured	33,397	44,840	61,005	78,996	105,817	147,105	195,654	34.3
Digital images printed	14,363	19,062	24,851	31,764	35,680	41,307	48,376	20.5
Home / Office	12,369	15,085	19,387	23,823	25,088	27,121	29,781	14.6
Retail	1,350	3,015	4,075	5,597	7,528	9,973	12,975	33.9
Internet	645	962	1,389	2,344	3,063	4,213	5,620	42.3
Film								
Retail*	100,445	100,833	100,995	100,833	100,632	100,330	99,828	-0.2

* Retail film prints include onsite processing (mini-labs) and wholesale processing

Source: adapted from IDC, 2002

Exhibit 15 Worldwide Digital and Film Image Capture and Print Volume Revenue, 2000 - 2006 ($ in millions)

	2000	2001	2002	2003	2004	2005	2006	CAGR (%)
Digital								
Home / Office	6,833.8	8,482.4	10,901.5	13,629.1	14,352.6	15,648.7	17,183.6	15.2
Retail	899.6	2,010.2	1,996.7	2,238.8	2,634.9	2,992.0	3,892.5	14.1
Internet	316.0	365.4	486.2	703.2	919.0	1,263.8	1,686.1	35.8
Film								
Retail*	27,120.2	27,224.9	26,258.7	25,208.3	24,151.6	24,079.1	22,960.5	-3.3

* Retail film prints include onsite processing (mini-labs) and wholesale processing

Source: adapted from IDC, 2002

Exhibit 16 U.S. Kiosks and Mini-labs Installed Base and Share by Type, 2000 - 2006E (units)

	2000	2001	2002	2003E	2004E	2005E	2006E	CAGR (%)
Kiosks	21,343	24,385	29,159	36,915	49,378	68,549	96,381	31.6
Photo Printer (%)	100	78	68	24	16	15	11	-
Digital Printer (%)	0	22	32	58	56	54	51	-
Order Station (%)	0	0	0	18	28	31	38	-
Mini-labs	35,780	36,104	36,896	38,230	39,931	41,483	43,557	3.8
Digital (%)	6	11	21	31	40	48	62	-
Analog (%)	94	89	79	69	60	52	38	-

Source: Adapted from IDC, 2002

Exhibit 17 U.S. Retail Mini-lab Market Competitive Dynamics, 2002

Store name	Retail channel	Stores	Mini-labs	Manufacturers
Walgreen's	drug	3,520	3,380	Gretag, Fuji
CVS	drug	4,129	3,009	Gretag, Noritsu
WalMart	discount	4,414	2,300	Fuji
RiteAid	drug	3,497	2,075	Gretag, Noritsu
Eckerd Drug Store	drug	2,641	1,780	Gretag, Fuji, Noritsu
Ritz	photo	1,270	1,270	Fuji
Albertson's	supermarket	2,306	1,110	Gretag, Noritsu
Kmart	discount	1,831	766	Gretag, Agfa, Noritsu
Wolk Camera	photo	688	688	Fuji, Agfa, Noritsu
Winn Dixie	supermarket	1,153	581	Konica, Gretag
Kroger Co.	supermarket	3,211	561	Gretag, Fuji, Noritsu
Target	discount	1,053	400	Gretag
Fred Meyer	drug	385	385	Gretag, Fuji, Konica, Noritsu
Moto Photo	photo	282	282	Fuji, Agfa, Noritsu
Costco Wholesale	discount	365	273	Fuji, Noritsu
Longs	drug	437	268	Fuji, Noritsu
Safeway	supermarket	1,773	216	Gretag, Noritsu
H.E. Butt Grocery Co.	supermarket	300	181	Fuji, Gretag, Noritsu
Meijer	discount	152	143	Fuji
Kits Camera	photo	140	140	Fuji

Source: adapted from Noritsu Koki, UBS Warburg, December 2002

Exhibit 18 Kodak Financial Statements, 1993-2003E ($ millions)

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002E	2003E
Revenues	12,670	13,557	14,980	15,968	14,538	13,406	14,089	13,994	13,234	12,692	12,808
Photography	5,292	5,919	6,830	7,659	7,681	7,164	7,411	10,231	9,403	8,761	8,735
Professional	7,382	7,646	8,184	2,367	2,272	1,840	1,910	1,417	1,459	1,533	1,561
Health				1,627	1,532	1,526	2,120	2,220	2,262	2,279	2,390
Other				4,315	3,053	2,876	2,648	126	110	119	122
R&D	864	859	935	1,028	1,044	880	817	778	779	774	783
Operating Profit	1,248	1,309	1,941	2,203	1,771	2,065	2,454	2,170	1,233	1,211	1,316
Photography	931	878	1,254	1,324	1,072	1,080	1,304	1,430	787	663	777
Professional	317	431	687	319	284	330	396	233	165	194	205
Health				375	317	366	471	518	323	378	359
Other				185	98	289	283	-11	-42	-24	-25

Source: adapted from Salomon Smith Barney, 2002, and company's reports

Exhibit 19 Eastman Kodak: retail presence in China, 1994 - 2000 (number of stores)

	1994	1995	1996	1997	1998	1999	2000
Kodak	116	557	1,741	3,072	3,596	4,384	5,384
Fuji	223	1,124	1,986	2,800	3,000	3,000	3,000
Lucky	0	0	0	112	700	1,017	1,517

Source: adapted from Salomon Smith Barney, 2002, and company's reports

Exhibit 20 Eastman Kodak R&D Spending, 1977 - 2001 (in millions $)

	Sales	R&D	R&D / Sales
1977	5,967	351	5.88%
1978	7,013	389	5.55%
1879	8,028	459	5.72%
1980	10,815	520	4.81%
1981	10,337	615	5.95%
1982	10,815	710	6.56%
1983	10,170	746	7.34%
1984	10,600	838	7.91%
1985	10,631	976	9.18%
1986	11,550	1,059	9.17%
1987	13,305	992	7.46%
1988	17,034	1,147	6.73%
1989	18,398	1,253	6.81%
1990	18,908	1,329	7.03%
1991	19,419	1,337	6.89%
1992	20,183	1,419	7.03%
1993*	16,364	1,301	7.95%
1994**	13,557	859	6.34%
1995	14,980	935	6.24%
1996	15,968	1,028	6.44%
1997	14,538	1,230	8.46%
1998	13,406	922	6.88%
1999	14,089	817	5.80%
2000	13,994	784	5.60%
2001	13,234	779	5.89%

* Divesture of Eastman Chemical Company

** Divesture of non-imaging health businesses

Source: adapted from company's reports

Appendix A Competition in Digital Imaging

Competitor	Overview
Canon, Inc.	Headquartered in Tokyo, Canon had 2002 estimated sales of $23.4 billion and a net income of $1,04 billion. Office equipment (copiers, business machines, information and telecommunication equipment), its largest business, accounted for 76% of sales, with an operating margin of 18%, the optical segment accounted for 7.5% of total sales, with negative margins of –5%, while the camera segment, which included film cameras, video cameras, and digital cameras, accounted for 16.5% of sales, with margins of 12%,[72] an increment of 1.5 points over year 2000.[73] In the camera segment, digital cameras generated 44% of sales, and had the best operating margin (14.1% versus 11.7% in film cameras and lenses and 5.4% in camcorders)[74]. In 2001, the company presented a "two-pronged product model strategy", the F series, which pursued photo quality, and the S series, which went after speed. In 2002 the company introduced the I series, with the aim of combining the two qualities with an emphasis on design. Since Canon brought out its 2002 models (IXY Digital 320, PowerShot S45, PowerShot G3), the company had surpassed Fuji Photo Film in digital cameras for a top domestic market share of 23%. The company's global market share in digital still cameras was 12%, while in traditional single-lens cameras it was more then 38%. Canon was one of the early pioneers in electronic photography, being the first to commercialize a still-video camera in 1986.
Fuji Photo Film Co.	Fuji business was divided into three divisions: *imaging solutions*, which included photographic film, photo printing paper, developing services, cameras and digital cameras, and which accounted for 32.7% of 2002 sales; *information solutions*, which included equipment for printing, medical diagnosis, IT systems, LCD components, and other electronic devices, generating 28.5% of sales; and *document solutions*, which included printers and copiers handled by Fuji Xerox, with 38.8% of sales. Operating margins for the three segments were respectively estimated to be 29%, 49%, and 22%.[75] The company's foray into digital cameras was the Fuji DS-100, released in 1993 at $3,200;[76] the DS-100 featured a 720x488 (350,000) pixel area array CCD and could store up to 21 images on a removable memory card. By 2000 the company had become one of the two leading digital camera manufacturers (the other being Olympus Optical), with sales of one million units, a leading domestic share, and a global share estimated at 20%. Fuji's strengths in digital cameras stemmed from high-picture quality, which was delivered by its in-house-developed charge-coupled devices (CCDs), thanks to a photodiode aligned in a unique honeycomb fashion, and cost competitiveness, achieved through in-house production of both CCDs and lens, which made up most of a camera's cost. In the digital camera business, Fuji's operating profit margin for 2001 was estimated at 5%, while its traditional mainstay business (color film, color paper, X-ray film, and photo-sensitive plates and film) generated over 15%.[77] Although R&D emphasis in the 1990s had been on developing digital imaging systems,[78] Fuji's strategy in digital imaging was similar to Kodak's in emphasizing the coexistence of film and digital. Both companies focused on the incremental effects of digital technology on traditional film-based halide technology. In 1999, at a panel discussion hosted by the Photo Imaging Manufacturer's and Distributor's Association, a Fuji executive stated that "right now, film has too large a price/performance advantage over digital to be replaced any time soon", and Harushi Yagi, managing director and general manager of the international marketing division, said of Fuji's unceasing R&D investment in traditional silver photography: "It is too early to predict whether digital products and services will really grow within the next few years, [but] we are certain that consumers will still enjoy photography, which after all they can nowadays get with excellent quality and at favorable prices."[79] In 2002 the company declared its plan to shift from a silver-halide-film-based company to a digital products maker, to compensate for an expected decline in demand for silver halide over the medium term,[80] with products such as digital cameras, mini-labs, and X-ray equipment. The weighting of digital products in overall sales was estimated to have surpassed 50% for the first time in 2001, with a contribution to operating profit of 50%. By contrast, Kodak's digital weighting remained a low 25%. An important part of Fuji's digital strategy was the installations of digital mini-labs to expand its market share in photographic film. Digital mini-labs, $100,000 computer and processing machines located behind store counters, handled inputs from conventional film, digital camera cards, digital media (including floppy disks, ZIP disks, and CDs), and prints, and offered a variety of services, including high-quality prints, variety prints (e.g., prints with text, frames, and greeting cards), and data writing, for storage on CD-R, floppy disk, MO disk, or ZIP disk.[81] The company introduced the Frontier in 1996 as the "core of a picture applications infrastructure in the digital era."[82] Fuji had a share of more than 60% of

	the U.S. market for digital mini-labs, with installations of 5,000 machines at the end of March 2003, while Kodak had only 100 mini-labs in service.[83] Shipments of Fuji's digital mini-labs benefited from its acquisition of Wal-Mart's photo-finishing division in 1997, and from the replacement of existing Kodak's products by customers like the leading drug chain Walgreen's.
Hewlett Packard Co.	The new Hewlett Packard, merged with Compaq Computer Corporation, had combined revenues of approximately $81.7 billion in fiscal year 2001, with operations in more than 160 countries. The company's offerings were categorized into four core business groups: the imaging and printing group (printer hardware, all-in-ones, digital-imaging devices such as cameras and scanners, and associated supplies and accessories); the enterprise systems group, which provided the key technology components of IT infrastructure; services, and the personal systems group (desktop PCs, notebooks, workstations, thin clients, smart handheld and personal devices). In January 2002, at the International Consumer Electronics Show, CEO Carly Fiorina dedicated most of her speech to the power of digital imaging, arguing that it was the next big thing in the computing and communications industries.[84] Hewlett Packard's imaging and printing research teams had been working so fast to get ahead in this emerging line of business that they filed for 2,500 related patents in 2001 alone. By 2002 the company had gained a 7.5% global market share in digital cameras. Hewlett Packard's success in digital imaging was based on the aggressive pricing of cameras and printers, with the aim of increasing sales of high-margin inkjet consumables.
Nikon	In 2000 Nikon reorganized its two sales groups, consumer and industrial products, into four new categories: imaging products (film cameras, digital cameras, interchangeable camera lenses), precision equipment (IC steppers, LCD steppers), instruments (microscopes, measuring instruments, inspection instruments), and others (e.g., binoculars, telescopes). In the 1990s, Nikon's share in traditional film cameras had maintained a stable market share of 20% on a unit base[85]. In 2000 it held a 30% market share for SLR cameras and a 6% market share for compact and digital cameras, which had been profitable since 1999 (but with margins lower than on traditional cameras). In the 1990s, Nikon had targeted the more profitable higher-end segment, but from the beginning of the 2000s it started its expansion into the more popular 2-megapixel cameras. Analysts had compared Nikon's strategy in digital imaging with Canon's, because of its aim to "link digital cameras sales to peripherals, printing paper, ink, and other consumables, graphic engines, and CMOS sensors."[86] From 2000 to 2002, digital still cameras had been performing well, with an increasing contribution to sales of the imaging business (from 32% of the group sales in 2000 to 47% in 2002[87]), but with top players shipping three million to four million cameras per year, Nikon's scale of operation was still comparatively small.[88]
Sony Corp.	The company had sales of $19 billion for third quarter 2002, up 1.2% from the previous year, and an operating profit of $1.5 billion. The electronic segment of the world's largest supplier of audio-video equipment recorded sales of $12 billion, down 4.6% from the previous year, because of the PCs' negative performance, but a rising operating profit. Digital cameras and camcorders fueled profitability.[89] Sony, which first demonstrated its Mavica digital camera in 1982, initially focused its marketing efforts on high-end pre-press and professional photography applications. But during the 1990s success came from its original Mavica, which stored images on 3.5-inch floppy disks, more familiar to Americans than the image-storage chips used by most Japanese vendors[90]. In 1999 Sony enjoyed an 80% market share in the low-end segment, which on its own accounted for 46% of the digital mix sales. Industry experts believed that Sony's breakout performance with technically lower quality products highlighted two key strengths of the company, its brand and its customer orientation, which was reflected in its products' ease of use[91]. By 2002 Sony's bestseller model was still the Mavica. The company boasted the number-one position in 2001 in the United States with a 23% share, and a number-two position in both Europe (with a share of 16%, second to Canon) and Japan (17% share versus Fuji's 25%). Sony maintained EBITDA margins of more than 10% on its digital photo products: the greatest profit driver in the digital camera world is the CCD business, with EBITDA margins of more than 20% and a 60% worldwide market share.

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