

Competing in Constellations: The Case of Fuji Xerox

By Benjamin Gomes-Casseres

The relationship between Xerox and Fuji Xerox, its joint venture in Japan, is the centerpiece of this commentary on how alliances among companies are forging new units of economic power known as "constellations." Internal rivalry can put constellations at a disadvantage against single-company rivals, and the ability to manage the balance of competition and cooperation is critical to success.

In a world of global businesses and extended enterprises, it often makes more sense for companies to team up than go it alone. Here is how Xerox and Fuji Xerox collectively compete.

Cooperation among companies has grown rapidly since the early 1980's, as alliances have proliferated in one industry after another. At the same time, however, the competition in these industries has in many ways become even fiercer than before. This flies in the face of traditional economic thinking. As Adam Smith observed: "People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices."⁽¹⁾ In fact, modern alliances do not so much suppress business rivalry as transform it, giving it a new shape that is often even more virulent than the old.

The new "collective competition" grows out of the very dynamics of collaboration. Simply put, business rivalry now often takes place between sets of allied companies, rather than between single companies. The alliances among companies are forging new units of economic power -- "constellations" that compete against each other as well as against traditional single companies. In this new world, the way companies manage the collaboration inside their constellation affects the competitive behavior and performance of the group as a whole. And the performance of each

company comes to depend not only on its own capabilities and strategies but also on those of its allies and on its relationships to those allies.

The case of the Xerox Corporation and the Fuji Xerox Corporation shows how successful a constellation can be if it is managed effectively. In copiers and laser printers, the competition between Xerox and its archrival, Canon Ltd., was not one on one, company against company. Instead, a constellation of companies around Xerox competed with Canon, which operated as a single company. The Xerox constellation is complex, but at its core is a pair of allied companies -- Xerox and Fuji Xerox, the Xerox joint venture in Japan. Together, this pair develops products, penetrates markets, manufactures hardware and so on -- all the things that Canon does on its own. Fuji Xerox is thus much more than a curiosity on the periphery of Xerox's organizational chart: the two companies are comrades-in-arms. The Xerox constellation has enjoyed some powerful advantages as well as suffered some serious disadvantages because of this structure.

In one sense, the Xerox group and Canon were not all that different. After all, single companies and constellations simply represent different ways to control a set of capabilities so as to maximize their return. The single company can be thought of as having full control over its capabilities; in the constellation, control over the set of

capabilities of the group is shared among separate companies.

The Xerox group and Canon each had the set of capabilities needed to develop, make and sell copiers and laser printers worldwide. But these two rival organizations controlled their capabilities in different ways.

At the risk of oversimplification, we may say that Canon had full control over its capabilities, because it owned 100 percent of its laboratories, plants and marketing organizations in Asia, Europe and the United States.

In the Xerox group, as we shall see, control over the capabilities was split -- Fuji Xerox owned some assets and Xerox owned others; Fuji Xerox had rights to the Japanese market and Xerox to the United States market. And Xerox did not have full control over the capabilities of Fuji Xerox, even though it owned part of the venture's equity. Indeed, a tradition of Fuji Xerox autonomy gave Xerox even less effective control than the ownership structure of the joint venture might suggest.

How will such a constellation fare in competition with traditional single companies? The answer depends in part on the competitive context. As we will see, the Xerox constellation as originally designed was well suited to the context of the 1970's. But by the early 90's, new competitive demands gave the edge to Canon's way of controlling capabilities, and forced the Xerox group to restructure its constellation.

The battle between Xerox and Canon is thus a microcosm of collective competition. In comparison with competitive battles in other industries, it is well-defined and easy to grasp. Precisely because of that, it offers valuable lessons to managers bewildered by the new shape of business rivalry.

How Fuji Xerox Saved Xerox

The Xerox story is a classic one of a once-dominant company that lost its edge and was overcome by new rivals from unexpected sources. The difference this time is that Xerox relied on a constellation of allies to defend itself and ultimately to regain leadership in its industry.

The story begins in the 1960's, when the company's revolutionary plain-paper copiers took the industry by storm and made the name Xerox synonymous with photocopying. Xerox revenues grew at a record pace for an American business -- doubling every 10 months, from \$40 million in 1960 to \$1.2 billion in 1966. Xerox patents on plain-paper copier technology and the company's extensive sales and service network sustained its virtual monopoly in the field.

Beginning in 1970, however, new competitors started chipping away at the Xerox empire. Many of these competitors came from Japan and produced high-quality, low-cost machines. Some developed new technologies that circumvented Xerox patents; others benefited from American antitrust pressure on Xerox that led the company to license its key technologies.⁽²⁾ More than 20 plain-paper copier vendors operated worldwide in 1975; by then the Xerox share of worldwide copier revenues had plummeted to 60 percent, from 93 percent in 1971. Ricoh, the traditional leader in the Japanese market, became the top seller in the United States market in 1976.

David Kearns, who was then Xerox's chief executive, recalled the crisis his company faced at the end of the decade: "The Japanese were selling products in the United States for what it cost us to make them. We were losing market share rapidly, but didn't have the cost structure to do anything about it. I was not sure if Xerox would make it out of the 1980's."

Initially, Xerox had done little to respond to the rising tide of Japanese competitors in the low-volume end of the business. Xerox executives had been more concerned with the entry of I.B.M. and the Eastman Kodak Company into the copier industry, as these companies targeted the more lucrative mid- and high-volume segments of the market.(3) But the crisis forced Xerox managers to change their thinking. They also realized then that they had been ignoring a unique competitive asset in Japan -- their joint venture with the Fuji Photo Film Company.

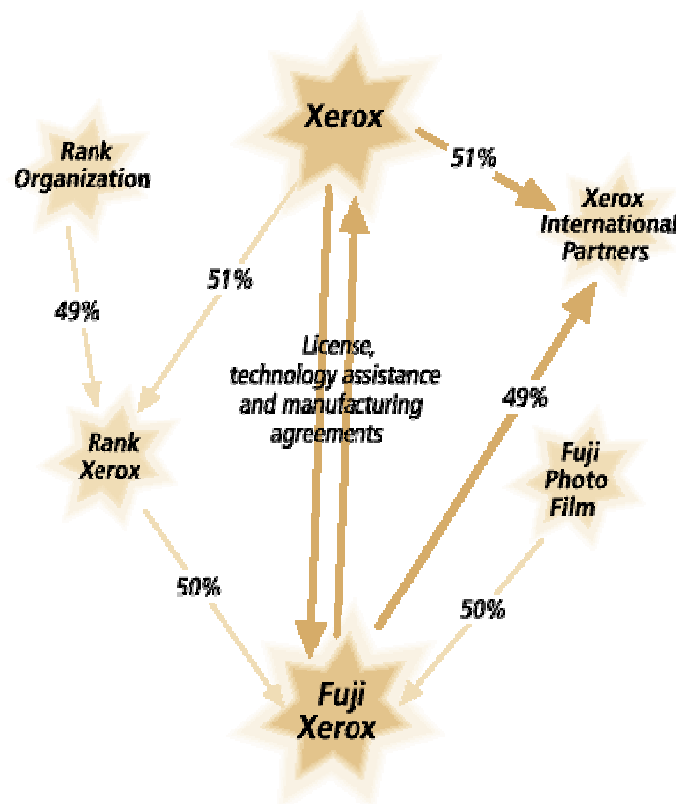
The Origin of the Xerox Constellation

Fuji Xerox was a 50/50 joint venture established in 1962 to market xerographic products in Japan and certain other countries in the region. Xerox had already used an alliance to expand internationally in the 1950's, when cash constraints led it to create a joint venture with Britain's Rank Organization.(4) Because it had acquired the rights to make and market xerographic products outside of North America, Rank Xerox became Fuji Photo's partner in Fuji Xerox. Exhibit I indicates the complex ownership relationships between these partners as of 1992.

Fuji Photo Film was a manufacturer of photographic film, second only to Kodak in that field. With sales of \$90 million in 1962, it was roughly the size of Xerox, although not growing as fast. The company was trying to diversify its business away from silver-based photography, and had already begun experimenting with xerography and its plain-paper technology. Still, under the agreement with Rank Xerox, Fuji Xerox -- not Fuji Photo -- received the exclusive rights to xerographic patents in its territory.(5)

Exhibit I: The Stars in the Constellation

Source: Gomes-Casseres, "The Alliance Revolution"



Structure of the Xerox constellation, 1992. Percentages indicate ownership shares. Darker arrows and stars indicate the more important relationships.

Fuji Xerox was destined to become much more than a marketing outlet for Xerox products -- it helped save Xerox from the demise that Mr. Kearns had feared. No one could have predicted this outcome. For a long time, Xerox executives treated Fuji Xerox with a benign neglect that sometimes bordered on condescension. This attitude changed dramatically in the 1980's, as Fuji Xerox came to the rescue of Xerox with a series of startling product breakthroughs and no-less-startling management, manufacturing and technology lessons. By 1990, Fuji Xerox had become "a critical asset of Xerox," as Xerox C.E.O. Paul A. Allaire called it.

The Separate Interests of Xerox and Fuji Xerox

The reasons behind the transformation of Fuji Xerox lay in that company's unique relationship with Xerox. By the early 1970's, Fuji Photo and Rank Xerox had each become passive partners in Fuji Xerox. Although they still held nominal decision-making powers, they were not involved in day-to-day activities and they did not continue to supply technology and expertise to the joint venture.⁽⁶⁾ For technology and business advice, as well as for certain products, Fuji Xerox turned directly to Xerox.

Xerox did not control Fuji Xerox, however, and was only entitled to a minority share of the profits generated by the joint venture. As a result, Fuji Xerox benefited from a flow of technology from Xerox, but also enjoyed an exceptional degree of autonomy. Yotaro (Tony) Kobayashi, Fuji Xerox's president and chief executive from the late 1970's to the early 90's and now its chairman, ascribed a good deal of the company's success to this autonomy. "The degree to which Xerox let us run was very unusual," he recalled.

The autonomy of Fuji Xerox also stemmed from sheer neglect. To many in Xerox, Fuji Xerox seemed a faraway outpost in a tiny market. Furthermore, it had no technical capabilities to speak of, particularly when compared with Kodak and the International Business Machines Corporation, the two giants breathing down Xerox's neck. When Fuji Xerox engineers proposed to develop an indigenous line of copiers tailored to local Japanese conditions, therefore, Xerox executives first tried to dissuade them and then turned a blind eye when they went ahead anyway.

The Rise of Fuji Xerox

The Japanese engineers had always aimed to develop an indigenous expertise in xerography. In the early 1960's, Fuji

Photo engineers began modifying Xerox designs to the needs of the local market; Japanese offices, for example, used different paper sizes. Later, Fuji Xerox managers wanted to go beyond adaptation to developing their own products. In particular, they envisioned a high-performance, inexpensive, compact machine that could copy books.

By the late 60's, the Fuji Xerox development group had produced four experimental copiers, each with projected manufacturing costs approximately half those of the smallest Xerox machine. When engineers at Rank Xerox and Xerox first heard of these machines, they doubted their commercial viability. But developers at Fuji Xerox persisted, and in 1970 they took a working prototype to London, where its performance amazed Rank Xerox executives. The machine was slow (5 copies per minute, or c.p.m.), but substantially smaller and lighter than comparable Xerox models. This demonstration boosted the technical reputation of Fuji Xerox. For the first time, Xerox allowed Fuji Xerox to have a small R.&D. budget. In 1973, Fuji Xerox introduced the FX2200, the world's smallest copier, with the slogan, "It's small, but it's a Xerox!"

Fuji Xerox's product development efforts went into high gear in 1975, when the company launched its Total Quality Control program. The focal point of the campaign was the development of *dantotsu*, roughly translated as the "Absolute No. 1 Product." Top management gave the marketing and engineering departments a seemingly impossible task: develop a compact, 40 c.p.m. machine, to be manufactured at half the cost of comparable machines and with half the number of parts of previous models, and do it in two years, instead of Xerox's typical four.

Two years later, this "impossible" product was ready. Mr. Kearns, for one, was amazed when he first saw a

demonstration of the prototype, and spontaneously broke out in applause. By 1979, the FX3500 had broken the Japanese record for annual sales of a copier. Largely because of its effort to develop the FX3500, Fuji Xerox in 1980 won the Japanese Government's prestigious Deming Prize, awarded annually to a company achieving outstanding quality.

The FX3500 was Fuji Xerox's "declaration of independence,"(7) but it was an independence born of necessity. The project came after Xerox had canceled a series of low- to mid-volume copiers on which Fuji Xerox was depending. Code-named SAM, Moses, Mohawk, Elf, Peter, Paul and Mary, each was canceled in mid-development, even though Fuji Xerox needed models of this type in its product line. Jefferson Kennard, the Xerox director of Fuji Xerox relations, recalled that when Tony Kobayashi was told about the cancellation of Moses, he was also asked to stop work on the FX3500 project. According to Mr. Kennard: "Tony refused, and said, in effect, 'As long as I am responsible for the survival of this company, I can no longer be totally dependent on you for developing products. We are going to have to develop our own.'"

Fuji Xerox to the Rescue

The growth in the technical capabilities of Fuji Xerox took place in what was for Xerox a "lost decade."(8) This was not a coincidence. The threat to Xerox's monopoly came from Japan, where new technologies, domestic demand and rivalry among producers generated a unique environment for product innovation. Xerox competitors like Ricoh, Canon and Minolta benefited from this environment, but so did Fuji Xerox. The joint venture had the additional advantage of direct access to Xerox technology coupled with autonomy.

"The fact that we had this strong company in Japan was of extraordinary importance when other Japanese companies started coming after us," Mr. Allaire, the chief executive, later explained. "Fuji Xerox was able to see them coming earlier, and understood their development and manufacturing techniques. If Fuji Xerox were within our organization, it would be easier, but then we would lose certain benefits. They have always had a reasonable amount of autonomy. I can't take that away from them, and I wouldn't want to."

But it took a while for Xerox executives to recognize the competitive value of Fuji Xerox. In 1978, Fuji Xerox offered to sell low-end copiers to Xerox and Rank Xerox to help them counter Japanese competition in their markets. At the time, Xerox did not yet see the need to do so. But Rank Xerox purchased 25,000 of the machines for sale in Europe.(9) The success of this transaction led Rank Xerox to import more of the Fuji Xerox machines. With this product -- and a delay in Kodak's entry to Europe -- Rank Xerox was able to defend its market, while the position of Xerox in the United States continued to decline.

A year later, Xerox too began to import the FX2202 and related machines into the United States. At first these products were assembled by Fuji Xerox. Then, acceding to the demands of American unions, Fuji Xerox exported them as knock-down units (kits of parts) to be assembled at Xerox. Over time, Fuji Xerox exported more and more finished products, disassembled kits and copier components to Xerox units worldwide -- as much as \$800 million by 1994.

The Fuji Xerox exports to Xerox helped stem the advance of the competition, but they did not change how Xerox developed, manufactured and marketed its own products. Fuji Xerox's quality control program, however, eventually served as a model for Xerox that led to deep changes

in these areas as well. Xerox acquired management ideas, subcontracting approaches, product development techniques and competitive data from Fuji Xerox. Through this reverse flow of technology, Fuji Xerox helped Xerox get back on its feet.

The Transformation of Xerox

The Xerox turnaround can be traced to about 1979, when Mr. Kearns took a close look at the strategies and products of Fuji Xerox and other Japanese companies. Xerox engineers were amazed by the Fuji Xerox reject rate for parts, which was a fraction of the American rate, and by the substantially lower manufacturing costs at the joint venture. Visits to Fuji Xerox facilities introduced Xerox executives to the practice of "benchmarking," which systematically tracked costs and performance in all areas of operations against those of the best in the field. Xerox's own benchmarking studies helped fuel Mr. Kearns's efforts to infuse his organization with new vision and determination.

In 1981, Mr. Kearns announced a company-wide initiative for "business effectiveness," and two years later he formally launched the Leadership Through Quality program, based partly on the experience of Fuji Xerox. Throughout the effort, Mr. Kobayashi and others at Fuji Xerox were called on for help. Xerox hired Japanese consultants recommended by Fuji Xerox, and some 200 high-level Xerox and Rank Xerox managers visited Fuji Xerox in later years to learn directly about its quality management program.

The rallying point for the Xerox quality movement was the development of the 10 Series, a new family of copiers. Dubbed the "Marathon" family, this became the most successful line of copiers in Xerox history and served to restore the company's finances and morale. The flagship Xerox 1075 became the first American-made product to win Japan's

Grand Prize for Good Design. Altogether, 14 models were introduced between 1982 and 1986, six of which were still sold in 1990. Fuji Xerox designed and produced the low-end models in the series -- the 1020, 1035 and 1055, the latter drawing on basic technologies from the FX3500, the first machine that Fuji Xerox developed internally.

Because Xerox's Japanese competitors were not strong in mid-volume copiers at the time, the 10 Series forestalled their move into that segment of the market and helped Xerox win back market share. On the strength of the 10 Series, Xerox regained 2 to 3 percentage points of market share in 1983, and 12 points in 1984. By the end of 1985, more than 750,000 of the new machines had been rented or sold, accounting for nearly 38 percent of Xerox's worldwide installed base.

Xerox continued throughout the 1980's to change the way it did business. Taking another leaf from the Fuji Xerox book, the company reduced its supplier base, bringing the cost of purchased parts down by 45 percent. Average manufacturing costs at Xerox were reduced by 20 percent and the time-to-market for new products was cut by 60 percent. This progress was recognized by the Commerce Department in 1989, when the company won the Malcolm Baldrige National Quality Award.

Fuji Xerox Gains Greater Independence

Fuji Xerox continued to grow and mature through the 1980's. Its dollar revenues grew faster than Xerox's, and by the end of the decade represented a more significant portion of the Xerox group's worldwide revenues than ever before. Fuji Xerox's financial contribution to Xerox's net earnings in the form of royalties and profits had also grown sharply -- from 5 percent in 1981 to 22 percent in 1988. And throughout the decade, Fuji Xerox

had been an important source of low-end copiers for Xerox. Between 1980 and 1988, Fuji Xerox's sales to Xerox and Rank Xerox grew to \$620 million, from \$32 million.

The technological capabilities of Fuji Xerox continued to broaden and deepen in the 80's. Fuji Xerox's increased technological strength is partly reflected in the technology fees it received from Xerox for designs it supplied to Xerox. These fees were introduced when the technology agreements between Xerox and Fuji Xerox were renegotiated in 1983. The new agreement also called for a gradual decline in Fuji Xerox royalty payments to Xerox, in anticipation of a declining value of xerography.(10)

Another measure of the growing capability of Fuji Xerox was the proportion of models developed in-house. In the 70's, the majority of models sold by Fuji Xerox had been developed by Xerox. Although Fuji Xerox continued to rely on Xerox for basic research in new technologies, by the late 80's few of its models were designed by Xerox. For the most part, these were high-end copier models, working at speeds of above 120 c.p.m. By the late 80's, Fuji Xerox had produced many low-end models, and even a few in the 60-90 c.p.m. range.(11) Many of these were exported to or manufactured by Xerox and Rank Xerox. In 1980, 30 percent of the low-volume units sold by Xerox and Rank Xerox were of Fuji Xerox design; by 1987, that figure was 94 percent. Xerox and Rank Xerox continued to design and make their own mid- and high-volume copiers, however.

Closer Collaboration to Meet New Challenges

By the 90's, Xerox and Fuji Xerox faced new competitive challenges and were determined to meet them together. One challenge was the rising capabilities of Canon. Although Xerox's precipitous decline in the 70's had been stemmed and

many of its competitors from that decade had faded away, Canon's copier business continued to expand. From 1980 to 1989, Canon's sales grew to \$9.4 billion, from \$2.9 billion, a gain of 14 percent a year. Canon's R.&D. spending grew even more rapidly, at 24 percent a year, to \$525 million, from \$77 million. By 1989, Canon was no longer primarily a camera company -- 40 percent of its revenues came from copiers, and 20 percent from laser printers.

In the second half of the 80's, Canon developed a dominating presence in the low-end laser printers that were becoming ubiquitous companions to microcomputers. Laser-printing technology was closely related to plain-paper copying technology, and as digital copying systems were introduced, the importance of laser printing in the copier market was bound to increase. Canon's laser-printing engines were the core of the highly successful Hewlett-Packard Laserprinter series, which accounted for about 50 percent of laser printer sales in the United States. This original equipment manufacturer, or O.E.M., business was thought to yield Canon \$1 billion in revenues. In the rest of the world, Canon sold printers under its own name.

In copiers, Canon was strong in the low end of the market, and the company had recently developed a growing business in color copiers, where it held 50 percent of the market by 1989. Analysts pointed out that Canon was introducing twice as many products as the Xerox group, although it spent less than \$600 million on R.&D. annually, compared with Xerox's \$800 million and Fuji Xerox's \$300 million. Canon's goal was to become a \$70 billion company by 2000, which would require a 22 percent annual growth rate in the 90's. A significant portion of this growth was projected to come from Xerox's heartland of high- and mid-volume copiers and printers.

Xerox, however, was determined to be aggressive in its response. The company's strategists now saw the relationship between Xerox and Fuji Xerox as a critical element in competing worldwide against Canon. Canon had a strong presence in all major world markets, as did the Xerox companies. But Paul Allaire highlighted a major difference in the two companies' global networks: "When we negotiate with Fuji Xerox, we can't just represent ourselves. We need to find what is fair and equitable to essentially three partners. Canon is 100 percent owned by one company."(12)

Tony Kobayashi saw the difference between Canon and Fuji Xerox in this way: "We often compare our situation with that of Canon or Ricoh, companies that have a single management organization in Japan. Are we as efficient and effective in the worldwide management of our business as we could be?"

In addition to this potential scale advantage in manufacturing, Canon appeared to gain from its centralized research.

In the late 80's, therefore, the Xerox partners began to work more closely together. In research, they launched their first joint projects, in which they agreed on "lead" and "support" roles and eliminated overlapping activities. Research collaboration between the companies was reinforced by exchanges of personnel and by an evolving communication process. Personnel from Fuji Xerox spent time as residents at Xerox, and engineers from both companies frequently crossed the Pacific to provide on-the-spot assistance. These personnel exchanges were also an important channel for the transfer of technology between the companies.(13)

Efforts were also made to intensify cooperation in product development, manufacturing and planning. Mr. Kennard, the Xerox director of Fuji Xerox relations,

and William Glavin, vice chairman of Xerox, worked together to launch "strategy summits." These top management meetings, held about twice a year during the 80's, led to further meetings between the functional organizations on each side. The personnel exchanges and summit meetings contributed to a constructive relationship.

"Whenever a problem came up, we established a process to manage it," Mr. Kennard explained. "The trust built up between the companies has been a key factor in the success of this relationship. It enables one to take on short-term costs in the interest of long-term gains for the group."

Uniting Separate Interests

In the context of the recognized need for closer collaboration, Mr. Allaire and Mr. Kobayashi commissioned a "Co-destiny Task Force," charged with developing a framework for cooperation between the two companies for the 90's. One of the issues addressed by the team was how the Xerox group should manage the low-end laser printer business in the United States.

Most laser printers were assembled by O.E.M. customers using image output terminals (I.O.T.'s) produced by vendors such as Canon, Matsushita, Oki and Fuji Xerox. These terminals were the hardware innards of the printer, that is, the drum, photoreceptor, laser and paper-handling mechanism. O.E.M.'s added their own electronic and software subsystems. Dependence on O.E.M. customers and high volumes of production made for fierce competition in the I.O.T. business.

"The margins in this business are razor-thin," commented Julius Marcus, vice president for strategic relations at Xerox. "And the business is very different from any with which Xerox or Fuji Xerox was familiar. You need to sell it before you have it, and price it before you know what

it costs." Furthermore, production costs for I.O.T.'s were highly sensitive to scale.

Bill Lowe, Xerox's executive vice president for development and manufacturing in 1990, recalled how Xerox and Fuji Xerox failed to work together effectively in this business.

"Both companies were trying to get full profit out of it, even though the margins were slim," he said. "Fuji Xerox's policy was to mark up costs; Xerox's was to get an acceptable gross profit. Furthermore, each product had a different markup scheme, and many sideline deals confounded the issues. This fostered sharp dealings between the partners. So, most of our energy was focused on each other, not on Canon. We were pointing fingers and frustrating ourselves."

Ultimately, however, Xerox and Fuji Xerox devised a creative response to the challenge of selling low-volume laser printers in the United States. In 1991, they established Xerox International Partners (X.I.P.), a joint venture to market Fuji Xerox printer engines outside of Japan. Xerox holds a 51 percent stake in X.I.P., and Fuji Xerox 49 percent; the first president of X.I.P. was an experienced Fuji Xerox executive and the first chairman was a senior Xerox executive. X.I.P. had a staff of fewer than 60 people, mostly in sales, but the new joint venture would also get help from Fuji Xerox engineers. The venture was licensed to sell in Xerox territory via certain specific O.E.M. customers outside of Japan, but most of its business was in the United States, where most global O.E.M. customers were based. X.I.P. would handle only low-end laser printers.

Executives from Xerox and Fuji Xerox felt that this new alliance gave them a better chance at competing in a tough market. They traced their earlier difficulties in that market, in part, to the lack of an appropriate organization for the business. Although Xerox had an existing O.E.M.

business, which it contributed to X.I.P., the business had lacked a competitive array of low-volume products. Fuji Xerox sold to Japanese O.E.M. customers, but was not licensed to sell in the United States; furthermore, the competitive environment in Japan was less fierce. The new alliance would give Fuji Xerox more direct contact with customers in the United States and align the two companies behind a common business strategy for this specialty market.

Perhaps because of the need to get the "right" structure for the alliance, it took the companies a year to negotiate the X.I.P. agreement. From the beginning, the aim was a structure that would create incentives for collaboration. Mr. Marcus, who was the Xerox executive in charge of these negotiations, stated his philosophy: "I am not a believer in management, but rather in organization. An agreement needs to be self-policing." The negotiating teams left no stone unturned, he noted: "A lot of bright people argued down all the alleys looking for potential future problems. We spent our time going through all the 'what if' questions. We took the agreement apart and put it back together. Because of this searching, things should be pretty smooth. Throughout all these arguments, we maintained a long-term vision."

Toshio Arima, chief negotiator for Fuji Xerox, agreed with this assessment. "It remains to be seen if we will survive in the business," he said in 1993, "but X.I.P. is already a success in terms of the strategy and the arrangement."

Among other things, the new arrangement aimed to alleviate friction over how profits from the business would be shared. The joint ownership of X.I.P. helped to align the interests of Xerox and Fuji Xerox. In addition, the negotiators practiced "mathematical gymnastics to create a seamless company with all the right incentives to succeed," Mr. Marcus

explained. "Now it is only us, not we and they."

The seamless company reached all the way to Japan, where Fuji Xerox created a separate unit for the low-end printer business. This unit transferred products to X.I.P., which then sold them to the O.E.M. customers. The agreement also set the ratio at which profits from the whole business would be shared between Xerox and Fuji Xerox; the level of transfer prices would not affect this ratio.

The new arrangement also helped Fuji Xerox upgrade its capabilities more rapidly. Tommy Tomita, a Fuji Xerox planner, summarized the impact of this venture in 1993: "Through X.I.P., Fuji Xerox was thrown into a new arena. Today, we can take on Canon because of the discipline we learned from the U.S. market. X.I.P. helped us see the need for low-cost engineering and showed us how to fill the needs of our customers."

To fill these needs, Fuji Xerox completely changed the way it designed and built laser printer engines. It created a business unit dedicated to the development of I.O.T.'s and made the engines in a factory specializing in high-volume production. Even more important were the changes in management. Fuji Xerox engineers were involved, for the first time, in direct discussions with O.E.M. customers in the United States. Mr. Marcus described other changes: "They made a huge commitment to turn things around. They changed suppliers, inventory management practices, design processes, sourcing and so on. You name it, they changed it -- everything in the food chain. The organizational learning was tremendous."

The changes at Fuji Xerox paid off. Between 1989 and 1993, the company developed and marketed three generations of printer engines, each one better and more cost-effective than the previous one. Xerox managers estimate

that, in 1990, the Fuji Xerox I.O.T. was technically inferior to the benchmark set by Canon, and 25 percent more expensive to produce. Their 1993 offering, however, was fully up to par technically, and almost at the benchmark level in terms of production cost.

X.I.P.'s early results were encouraging. On the strength of the new Fuji Xerox products, X.I.P. gained major customers in Digital Equipment, Compaq, Apple, Star and other companies, in addition to supplying Xerox itself. The printer engine business remained dominated by Canon, which held about 80 percent of the global market. Fuji Xerox, however, was starting to make inroads. By 1996, its share of various market segments had risen considerably.

Structure and Performance in Constellations

The Xerox story clearly shows how a company can benefit from a well-managed alliance. But it also shows how the difficulty of integrating the separate interests of partners can handicap constellations that face powerful single companies. Moreover, the optimal design and governance structure for an alliance can change dramatically over time, in response to changes in the environment, as well as in the partners themselves.

The collaborative arrangements that helped launch Fuji Xerox in the 1960's and 70's were not as effective in the fierce global battle to develop new technologies in the late 80's. Instead of relying on the transfer of technologies from one to the other across the Pacific, Xerox and Fuji Xerox were forced to join forces to develop wholly new technologies together. This meant that the managerial autonomy that served Fuji Xerox so well in the 70's had to give way to greater coordination and integration between the partners.

Collective competition always requires that companies walk a fine line between

rivalry and collaboration. More so than single companies, constellations have within them sources of conflicts that can tear them apart. At the very least, internal frictions can reduce a constellation's ability to exploit benefits from collaboration. And lacking these benefits, the group stands little chance in the competitive marketplace.

Companies have several mechanisms at their disposal with which to manage the balance of competition and cooperation. Equity investments, multiple projects, long-term relationships, personnel exchange and other mechanisms can be used to enhance incentives for collaboration within a constellation and to reduce internal rivalry.

Still, because of the added burden of managing internal frictions, constellations often operate at a disadvantage when facing strong single companies. Overcoming these disadvantages usually requires greater integration among members of a constellation.

In many modern businesses, constellations do not face all-powerful single companies. Instead, the battle is one of group versus group. In this context, all competitors share the basic handicap of internal friction, even though some might manage this handicap more effectively than others. Furthermore, differences in the composition and structure of the constellations are likely to provide one group with a competitive advantage over another.

Competing in constellations, therefore, involves more than just simple competition. To win these days, you need not only a killer instinct but also the willingness -- and the ability -- to collaborate.

Effective constellations depend not only on the structure of relationships among partners but also on the evolution of these relationships. Alliances are dynamic and

open-ended relationships that easily bend -- and often crack -- when subjected to new competitive forces. That is sometimes seen as one of their weaknesses: managers frequently cite the high "divorce rate" of alliances as a problem. But, ironically, the flexibility of alliances can be a formidable advantage, so long as the instability inherent in them is managed properly.

Some of the drivers of change are inside the constellation and some are outside. Changes in context -- that is, in technology, market pressures or in the other businesses of the alliance partners - - can change the costs and benefits of a particular alliance. Organizations that adjust to new circumstances may survive, others typically suffer deteriorating performance and decline.

The effects of internal drivers of change are more complex and less deterministic. Often, the process of internal change can be represented as a circle of causation: the initial capabilities of partners determine the initial balance of power in an alliance; the alliance in turn shapes and transforms the partners' capabilities; these new capabilities then shift the balance of power, and so on. Such a process can be a vicious circle to the partner who sees its relative capabilities decline and control slip away, and a virtuous circle to the other party.

This circle of causation is evident in the relationship between Xerox and Fuji Xerox. The Japanese joint venture was set up to transfer xerography to Japan and adapt it to local market conditions. As Fuji Xerox did that, it became increasingly capable in developing and manufacturing its own low-end copiers. Gradually the division of labor between the companies shifted, and Fuji Xerox acquired more and more responsibility in the Xerox global strategy. Decision-making structures were adjusted accordingly, until Fuji Xerox became -- for all practical purposes -- an equal partner to Xerox in selected businesses. The

steady series of adjustments in response to new capabilities in this constellation is summarized in the accompanying exhibit.

Exhibit II: Evolution of the Relationship Between Xerox and Fuji Xerox

Source: Interviews at Xerox and Fuji Xerox

Changes in Capabilities	Changes in Relationship
Fuji Xerox develops manufacturing capability	Transfer of plants from Fuji Photo to Fuji Xerox (1970)
Fuji Xerox designs and manufactures machines for sale in United States and Europe by Xerox	Technology agreements and R.&D. reimbursement plan between Xerox and Fuji Xerox (1976-1978)
Fuji Xerox learns from experience and through own R.&D.; institutes Total Quality Control (T.Q.C.) program	Fuji Xerox allowed to fund own R.&D.; becomes major supplier to Xerox and Rank Xerox
Fuji Xerox product line is increasingly independent from Xerox's	Xerox adopts T.Q.C. ideas; uses Fuji Xerox as window on Japan
Fuji Xerox's ambitions in Asia and United States markets grow	New technology assistance and product acquisition agreements lower royalties and institute manufacturing license fees for Fuji Xerox (1983)
Fuji Xerox develops new expertise in low-end printers	South Pacific Operations sold to Fuji Xerox (1990); Xerox International Partners created in United States (1991)

The sequence of strategies adopted by Xerox and Fuji Xerox was not planned beforehand; instead, one thing led to another. The Xerox case is not unique in this sense: alliances seldom end up as they started. Although some aspects of their evolution may be predictable, many others are not.

This conclusion highlights one of the key underlying differences between single companies and constellations. Single companies, too, evolve and are subject to forces of change. But in companies, there are also more forces against change -- bureaucracies with ingrained interests, established ways of doing things, loyalties among employees, market positions and image to defend and so on. As a result,

the evolution of companies is more predictable than is the evolution of a constellation -- it adheres more closely to a common theme and path.

The lesson for managers is clear: alliance instability should not be feared, but embraced. Indeed, managers should be wary of alliances that are too stable, a condition that may indicate stagnation or, worse, mounting pressure for change. Effective alliances evolve continually to keep up with changes in the environment and in the partners' capabilities and goals.

Also, a rival's use of alliances may create pressures for new alliances or for modifications to one's constellation. And the of an alliance will typically need to be changed to allow the partners to pursue new opportunities.

When companies use alliances in competitive battle, the nature of that battle changes. The essence of the new collective competition is that alliances inside constellations influence rivalry among constellations, and the reverse.

Xerox and Fuji Xerox, for example, collaborated at one level and competed at a higher level with Canon. The same is true for larger constellations facing each

other in today's telecommunications, multimedia and other high-technology, global industries.

In every case, collaboration *within* constellations occurs in tandem with competition *between* constellations. As a result, the following patterns frequently arise:

1. Collaboration within a constellation tends to enhance the group's competitive advantage, because it allows the group to marshal its internal resources more effectively.

2. By the same token, competitive friction within a constellation usually dulls its competitive edge, by diverting and duplicating internal efforts.

3. Competition between constellations tends to enhance collaboration within them, because it draws members closer together behind a common goal.

4. Conversely, forces that reduce rivalry between groups -- such as common standards or common allies -- tend to hurt the unity of each group by generating split loyalties.

5. Finally, rivalry among members of a constellation, while usually reducing the effectiveness of the group as a whole, sometimes benefits individual members by increasing their bargaining power over other members.

Do these conclusions apply to your industry? The answer depends on whether collective competition has spread in your business. You have to look carefully at the competitors in the industry and examine how products are developed, manufactured and sold.

Are alliances important in many parts of the value chain? Is the web of

relationships in the industry dense and intricate? Are there few companies left that still compete as single entities, relying mostly on internal capabilities and on arm's-length contracts with outsiders? Have constellations changed the terms of competition, such as the scale and scope required for success?

Exhibit III: Selected Businesses with Collective Competition, c. 1994

Source: Gomes-Casseres, "The Alliance Revolution"

Business or Industry	Selected Rival Constellations
Hardware and software for interactive TV	<ul style="list-style-type: none"> > Motorola, Scientific Atlanta, Kaleida > Time Warner, Silicon Graphics > Intel, Microsoft, General Instruments > H.P., TV Answer
Video CD's	<ul style="list-style-type: none"> > Sony and Philips > Toshiba, Time Warner, Matsushita, others
Global telecommunications	<ul style="list-style-type: none"> > AT&T Worldpartners (includes 12 partners) > British Telecom and MCI > Sprint, Deutsche Telekom, France Telecom
Automobiles and trucks	<ul style="list-style-type: none"> > G.M. Toyota, Isuzu, Suzuki, Volvo > Ford, Mazda, Kia, Nissan, Fiat, VW > Chrysler, Mitsubishi, Daimler-Benz
Biotechnology research	<ul style="list-style-type: none"> > Genentech network > Centocor network
Pharmaceutical marketing (United States)	<ul style="list-style-type: none"> > Merck and Medco (merger) > SmithKline and DPS (merger) > Eli Lilly and PCS (merger) > Pfizer and Value Health > Pfizer, Rhône-Poulenc, Caremark, others
Global airline services	<ul style="list-style-type: none"> > Delta, Swissair, Singapore Airlines, SAS > KLM and Northwest > British Airways and USAir

The evidence so far suggests that collective competition has already emerged in a wide variety of environments and will continue to spread. The accompanying exhibit gives a sampling of businesses already in the throes of the new style of rivalry.

A constellation is only as strong as the alliances that link its partners to each other. To win in collective competition, therefore, companies must carefully manage their key alliances. Here are the factors that have made alliances such as that between Xerox and Fuji Xerox successful:

1. *Have a clear strategic purpose.* Alliances are never an end in themselves - they ought to be tools in service of a business strategy.

2. *Find a fitting partner.* This means a partner with compatible goals and complementary capabilities.

3. *Specialize.* Allocate tasks and responsibilities in the alliances in a way that enables each party to do what each does best.

4. *Create incentives for cooperation.* Working together never happens automatically, particularly when partners are former rivals.

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FOOTNOTES

(1) Adam Smith, "An Inquiry Into the Nature and Causes of the Wealth of Nations" (Modern Library, Random House, 1937), p. 128. Originally published in 1776.

(2) The rise of new competitors was in part enabled by the Federal Trade Commission's antitrust actions against Xerox. In 1973, the F.T.C. charged that Xerox's pricing, leasing and patent-licensing practices violated the Sherman Antitrust Act. It demanded that Xerox offer royalty-free licenses on all its copier patents, that it divest itself of Rank Xerox (its joint venture with Britain's Rank Organization) and Fuji Xerox and that it allow third parties to service copiers leased from Xerox. Xerox signed a consent decree in 1975, in which it agreed, among other things, to license more than 1,700 past and future patents for a period of 10 years. Competitors were permitted to license up to three patents free from royalties, to pay five-tenths of 1 percent of revenues on the next three and to license additional patents royalty-free. Kodak, I.B.M., Canon and Ricoh were among the companies to secure Xerox licenses under this arrangement.

(3) It was I.B.M.'s introduction of its Copier series in 1970 that signaled the end of the Xerox monopoly in its home market. This line of products, however, was dogged by performance problems. A more serious threat came from Kodak's popular and high-performance Ektaprint series, introduced in 1972.

5. *Minimize conflicts between partners.* The scope of the alliance and of partners' roles should avoid pitting one against the other in the market.

6. *Share information.* Continual communication develops trust and also keeps joint projects on target.

7. *Exchange personnel.* Regardless of the form of the alliance, personal contact and site visits are essential for maintaining communication and trust.

8. *Operate with longtime horizons.* Mutual forbearance in solving short-run conflicts is enhanced by the expectation of future gains.

9. *Develop multiple joint projects.* Successful cooperation on one project can help partners weather the storm in less successful joint projects.

10. *Be flexible.* Alliances are open-ended, dynamic relationships that need to evolve in step with their environment and in pursuit of new opportunities.

- (4) The joint venture with Rank was formed in 1956, with Xerox holding 50 percent of the equity. In 1969, the Xerox share was increased to 51 percent, and Xerox took over management control of Rank Xerox. In 1995, Xerox purchased additional shares from Rank to bring its ownership up to 71 percent.
- (5) As part of its technology licensing agreements with Rank Xerox, Fuji Xerox had exclusive rights to sell the machines in Indochina, Indonesia, Japan, the Philippines, South Korea, Taiwan and Thailand. In return, Fuji Xerox would pay Rank Xerox a royalty of 5 percent on revenues from the sale of xerographic products. Rank Xerox would, of course, also be entitled to 50 percent of Fuji Xerox's profits. By agreement, 66 percent of Rank Xerox profits (that is, 33 percent of Fuji Xerox profits) flowed to Xerox between 1969 and 1995. After Xerox increased its share of Rank Xerox to 71 percent in 1995, 80 percent of Rank Xerox profits flowed to Xerox (that is, 40 percent of Fuji Xerox profits). Originally, Fuji Xerox was designed to be purely a marketing joint venture to sell copiers made by Xerox or by Fuji Photo. When the Japanese Government refused to approve a joint venture intended solely as a sales company, however, the agreement was revised to give Fuji Xerox manufacturing rights. In the early years, Fuji Xerox subcontracted Fuji Photo Film to manufacture the products.
- (6) Rank Xerox became a passive partner because Xerox acquired control of Rank Xerox in 1969, when it increased its shareholding to 51 percent, from 50 percent; from then on, Rank Xerox decisions were controlled by Xerox. The reasons behind Fuji Photo's passive stance are more complex. In 1971, Fuji Photo transferred its copier plants to Fuji Xerox. In an interview in September 1990, Yoichi Ogawa, one of the executives transferred from Fuji Photo to launch Fuji Xerox, explained how the contract with Xerox raised barriers to technology flow between Fuji Xerox and Fuji Photo: "According to Fuji Photo's agreement with Xerox, the company, as a shareholder, could collect information from Fuji Xerox, but it could not use it in its own operations. In addition, a technology agreement between Fuji Xerox and Xerox provided that any technology acquired by Fuji Xerox from outside sources (including from Fuji Photo) could be passed on freely to Xerox.
- (7) Gary Jacobson and John Hillkirk, "Xerox: American Samurai" (Macmillan, 1986), p. 299.
- (8) Ibid.
- (9) Although Xerox had acquired control of Rank Xerox in 1969 by raising its share of equity to 51 percent, the line operations of the two companies were not integrated until 1978. Rank Xerox could thus make this decision in relative autonomy.
- (10) Royalties were again renegotiated in 1993. Xerox then expected the royalties to increase over time, in recognition of the rising value of Xerox technologies supplied to Fuji Xerox.
- (11) Many of these models were manufactured by Fuji Xerox and transferred to Rank Xerox and Xerox for sale in Europe and the United States. This trend started with the FX2200 and the FX3500.
- (12) Paul Allaire was referring to the three ultimate parents of Fuji Xerox -- Xerox, Fuji Photo Film and the Rank Organization.
- (13) By 1989, an estimated 1,000 young Fuji Xerox employees had each spent three years as residents at Xerox, and about 150 Xerox people had done the same at Fuji Xerox. These residents were directly involved in the work of their host companies. Every year there were also some 1,000 shorter visits by engineers and managers.