The Home Video-Game Industry (1983-1996)

- Competitive Strategy Revolving around Industry Standards -

Table of Contents

1. The Problem Facing Nintendo

2. Summary of the Home Video-Game Industry
<Characteristics of the Home Video-Game Market>
<Characteristics of Home Video-Game Hardware>
<Characteristics of Home Video-Game Software>
<A Virtuous Cycle Between Hardware and Software>
<Competitive Conditions>

3. The Home Video-Game Industry, Period 1
<The Pre-Home Video-Game Era>
<History of Nintendo>
<The Success of Nintendo's Family Computer (Famicom)>
<Nintendo's Market Conduct and Power>

4. The Home Video-Game Industry, Period 2
<The Market Entry of NEC-HE and Sega's New Game Platform>
<History of Sega>
<Strategy of Each Firm and the Attributes of the New Products>
<Nintendo Reigns Again>

5. The Home Video-Game Industry, Period 3
<The Founding of SCEI and the Development of PlayStation>
<Strategy of Each Firm>
<How Each Firm Fared, 1995 and beyond>

6. The Prospects for Nintendo and Nintendo64
<Nintendo's Strategy>
<Nintendo's Market Results and Imminent Challenges>

This case was developed by Fumihiko Ikuine (The University of Tokyo, Faculty of Economics, Ph.D. Candidate) under the supervision of Assistant Professor Junjiro Shintaku also of The University of Tokyo as an aid to class discussion and is not intended as an evaluation of the management of the firms described herein.
This Case was translated by (The University of Tokyo, Faculty of Economics, Master. Candidate).
In the case "the present" is 1996. Yen/dollar exchange rates are calculated at 110/1

1. The Problem Facing **Nintendo**

Nintendo's headquarters is located in Higashiyama-ku, Kyoto. Over the past ten or so years **Nintendo**, a firm with under a 1000 employees, has been the overwhelming market share leader in both the Japanese and world home video-game markets. Up through recent years, **Nintendo**'s home video-game machines and compatible game titles have held domestic market shares of between 70 and 90 percent. Over this period, **Nintendo** has shipped an average of 2.5 million home video-game units a year, and at its peak, delivered over 4 million units to stores in a single year. To date, the only game titles which have ever surpassed the 1 million units sold level have been ones which run on **Nintendo** hardware, some of them being made by **Nintendo** itself, and others having been produced by software firms which operate under license from **Nintendo**.

Nintendo's status in the market is more than simply that of a market leader. The firm is indeed in a position which allows it to exert an unusual degree of influence on the entire market. Thus **Nintendo**, having been propelled forward by the industry's overall high growth rate, has evolved into an extremely profitable company. With total sales of approximately 300 billion yen ($2.7 billion) in 1996 (fiscal year ending in March), operating profits for the same year exceeded 110 billion yen ($1 billion). Profits of such a high level surpass those of NTT and Japan's major city banks in absolute terms, and the total even exceeds that of Toyota Motors in profits per employee.

Since 1994 however, **Nintendo**'s commanding position in the industry has increasingly come under threat due to heavy pressure from **Sega** and major audio/video maker **Sony** (in the form of its subsidiary, **Sony** Computer and Entertainment Incorporated [**SCEI**]). The assault on **Nintendo**'s dominance started in earnest at the end of 1994 when **Sega** and **SCEI** separately introduced new video-game machines. The challenge of these two rivals continues to the present, and is especially fierce in the courting of software firms. Hardware manufacturers pursue the cooperation of software firms to aid their efforts to establish full lines of game titles for their systems. One of the top prizes in the competition for software firms is a company called **Square**, the creator of the immensely popular game Final Fantasy, a game which has in the past contributed significantly to the diffusion of **Nintendo** hardware. The industry was shocked when **Square** announced its decision to sell the next iteration in the game series to run on a non-**Nintendo** platform.

Hoping to recover from its increasingly vulnerable position, **Nintendo** began selling a new home video-game machine, Nintendo64, in 1996. By the end of the year, unit sales of **Nintendo**'s new platform exceeded the one million mark, largely due to **Nintendo**'s synchronized release of a number of popular software titles for the new platform. However, even given this high sales total, at the end of 1996 cumulative sales of Nintendo64 lagged

behind those of **Sega** and **SCEI** by some 3 million units.

It was under such circumstances that **Enix**, maker of the game series Dragon Quest, announced in January 1997 that it would produce the next iteration of its popular game to run on **SCEI**'s PlayStation. The new Dragon Quest was projected to go on-sale in 1999. Like **Square**, **Enix** had long been a major contributor to **Nintendo**'s excellent market diffusion rate through the software firm's development of a long list of highly successful **Nintendo** compatible games.

Enix's announcement was especially surprising given the fact that the software firm was already selling one game for the Nintendo64 platform. The firm's prior indication that it intended to "sell the next Dragon Quest episode to run on whichever hardware sold the best"[1] had led many to believe that the firm would continue to create games centered around **Nintendo** machines. Thus, **Enix**'s decision caused a lot of surprise when it was announced. For a firm of **Enix**'s stature to make such a drastic change in its strategy attracted a lot of attention. In response to the move **Nintendo** replied that "this decision (by **Enix**) was the result of differences in opinion (between **Nintendo** and **Enix**), and so couldn't be helped. Nevertheless, there should be no negative effect on **Nintendo**'s business."[2] Despite **Nintendo**'s apparent lack of concern, many industry observers viewed the damage inflicted on **Nintendo** by **Enix**'s decision as no small matter.

As is briefly introduced above, the commanding market position so long preserved by **Nintendo** has come increasingly under threat in recent years. The charge is led by new hardware rivals, together with a number of software firms which had in the past have been close supporting partners of **Nintendo**. In light of the new competitive environment, what strategy can **Nintendo** adopt to successfully generate the kind of good hardware diffusion that it had with its previous machines? What does **Nintendo** need to do to recover the dominant position in the industry?

---

[1] Nihon Keizai Shinbun, 18 January 1997.

[2] Hiroshi Imanishi (member of Nintendo's Board of Directors), Ibid.

2. Summary of the Home Video-Game Industry

<Characteristics of the Home Video-Game Market>

A computer game consists of a computer program and the computer on which the program runs. One type of computer game is the home video-game. Computer games can also be played on personal computers and video-arcade machines. Home video-games differ from PC-games in that home video-games run on dedicated game playing computers. Home video-games differ from arcade machines in that home video-games are intended for home use and in their markedly different shape. In terms of both past and present markets and technology however, the different types of computer games exert a lot of influence on each other and have many points in common. The details of the relationships between the different types of computer games is elaborated in the following paragraph.

The three types of computer games share a common ancestor in the mainframe-based game programs developed by students and researchers in the late 1950s and early 1960s. Over time the games evolved according to technological and market developments, each splitting into a separate business opportunity. As a result of their common roots however, even today technical or market changes in, for example, the arcade-game industry have wide-ranging ramifications on the technological development and user base evolution of home video-games. Some of the firms in the computer game industry participate in multiple markets, supplying and transferring games across the various types of computer games. Thus, many firms are required to keep all three market segments in their field of vision when making strategic decisions.

In the home video-game industry, as in the personal computer industry, the computer program and the computer itself are sold to customers as separate products. In this case the products will be referred to as software and hardware respectively. A "single-hardware, multiple-software" structure is most common in the industry. Users can play many different games on a single hardware machine simply by interchanging software.

<Characteristics of Home Video-Game Hardware>

Next, the form and special characteristics of the hardware products of the home video-game industry are examined in greater detail.

The hardware component of home video-games generally consists of a CPU, various types of memory, a dedicated LSI chip for sound and video processing, a device for interfacing with software, a case to enclose the components, and a power supply. The machines typically use a regular household television set as a display.

The following three points can be summarized when comparing the hardware of a home video-game machine with that of a personal computer of similar form and employed for

a similar purpose.

The first difference between the two types of computers lies in the presence of a dedicated LSI chip for video and audio in home video-game machines. Although in recent years, personal computers equipped with such chips are becoming increasingly common, home video-game machines have possessed such chips from a very early stage in the development of the industry. Since the quality of a computer game is communicated to a user primarily by its sound and video capabilities, it seems obvious that the manufacturers of these single purpose game machines would put dedicated video/audio chips in their machines. However, it is noteworthy that the manufacturers of these products realized the importance of including these chips at such early stage. In terms of video and audio processing power, a home video-game machine of today is comparable to a top super-computer of just a few years ago.

The second notable difference between home video-game machines and personal computers is the remarkably better price-performance ratio the former is able to achieve over the latter. With few exceptions, nearly all home video-game machines, beginning with the industry's first highly successful product, **Nintendo** Famicom (Family Computer), have been sold at prices between 15,000 and 25,000 yen ($135-225). The low price has contributed greatly to the high diffusion rate of the game machines among its target audience and to the overall enlargement of the market.

It is accurate to say that the overall industry pricing of the game machines has been extremely effective. Nevertheless, an unwelcome effect of the low prices has been to put hardware manufacturers in a very tight price-performance tradeoff with respect to product development.

Faced with an uncompromising situation, each hardware manufacturer has resorted to a strategy which can best be summarized as "make zero or negative profits on the hardware, but make big profits on the software." So, while manufactures do not look to make money from their hardware sales, they do strive to keep their manufacturing costs as low as possible. Efforts in this regard have been aided by manufacturers choosing to pursue the complete specialization of their machines for the playing of games. Thus, home video-game machines lack keyboards, hard disks, operating systems, and other items not essential to game playing. This lack of 'extras' is one specific example of the results of the vigorous cost minimization efforts the manufacturers are obligated to pursue.

The technologies and internal parts (primarily the chips) found in home video-game machines are not usually of the cutting edge. Rather they typically come from older generations which are no longer useful in other computers or which can be mass produced at low costs. The use of such chips is another way manufacturers pursue low costs in the production of their machines. In recent years there have been some movements toward single chip home video-

game machines in an effort to reduce costs further.

The final important characteristic of the home video-game market is the absence of any inter-product compatibility. It may seem natural for there to be no compatibility across machines of rival manufactures; however, for the home video-game market this lack of compatibility extends even to the various products of a single manufacturer. While each company may have its own individual strategic reasons for not making its machines compatible, there are two industry-wide factors involved as well. First, there is an extremely high pace of technical advancement in the industry. The second factor is the need for hardware firms to pursue vigorously ever lower manufacturing costs.

Maintaining compatibility among one's own products is desirable from a strategic standpoint for a number of reasons. Such compatibility would allow a firm to both preserve and increase already established market share. As will become clear by the end of this case, market share plays a critical role in this industry. It is safe to say, therefore, that the lack of same firm inter-machine compatibility is more a result of manufacturers being unable to provide this capability than it is a result of their being unwilling to provide this convenience. Again, the main difficulties in providing this compatibility are the rapid technological change in the industry and the need for low manufacturing costs.

Evidence of the industry's rapid technological development can be found in the fact that since 1980, major changes in the capabilities and specifications of home video-game machines, in other words generational changes in the product market, have occurred at a 5-6 year pace. In addition to major advances in related technologies, this rapid technological change has been driven forward by product market trends and spillover from the video-arcade market.

Manufacturers of home video-game machines have been pushed hard to release new machines with ever higher functionality. Yet for users to make the jump to purchase a new platform, not only does the new machine have to far outdistance the previous generation machine, but it also must do so at a price that is equal to or only slightly higher than that of the previous generation. Such an unforgiving environment for hardware manufacturers continues to the present day and has significantly compounded the difficulties manufacturers face in making their new machines backward compatible. Less severe cost limitations would likely permit backward compatibility. Nevertheless, attempts at backward compatibility have had to be all but abandoned by hardware manufacturers given the harsh cost reality of the industry.

In summary, home video-game machines are special forms of computers which have developed such that inter-machine compatibility has been essentially impossible. Other uses for the machines which can be deemed non-essential to game playing have also been forsaken. The main reason for such complete specialization of the machines is that manufacturers have been forced to keep prices as low as possible while maintaining high audio and video performance.

<Characteristics of Home Video-Game Software>

In the home video-game industry, software is the term used to describe a computer program which has been written to run on a specific hardware format and which has been stored on some form of delivery medium. In the early stages of the industry software was generally encoded on ROM silicon chips; however, in recent years this format has generally been replaced by the CD-ROM which can be produced more easily in large volumes at low costs. On occasion, software has also been stored on magnetic disks. Prices for software have usually ranged from 5,000 to 10,000 yen ($40-80). Prices at the lower end have been for games for the early Famicom model and for products stored on CD-ROM disks. The higher prices have been for SuperFamicom and Nintendo64 games which still employ ROM silicon chips. (All prices are listed at manufactures suggested retail prices.)

The roots of the distinguishing characteristics of home video-game software come from the product's original purpose which was simply to provide enjoyment for a user. Apart from relying on the judgment of users, i.e., the success or failure of a product in the market, there is no real basis for deciding whether a specific game is good or bad. As a result, there is a strong element of unpredictability as to which new game titles will succeed and which will fail.

The unpredictability of software is particularly vexing because of the tremendous difference in sales which is seen between successful and failed titles. If a particular game gets very hot in the market, not only can it improve the market diffusion of the hardware on which it runs, but it can even exert a discernible impact on the overall growth of the entire market. In contrast, there are countless examples of games which sell barely a single copy. In addition, historically, it has been difficult for firms in this industry to use pricing policy to influence software sales.

In summary, software titles for home video-game machines have a high variation in sales between successful and unsuccessful games. The product also has a high level of uncertainty in forcasting demand and low price elasticity.

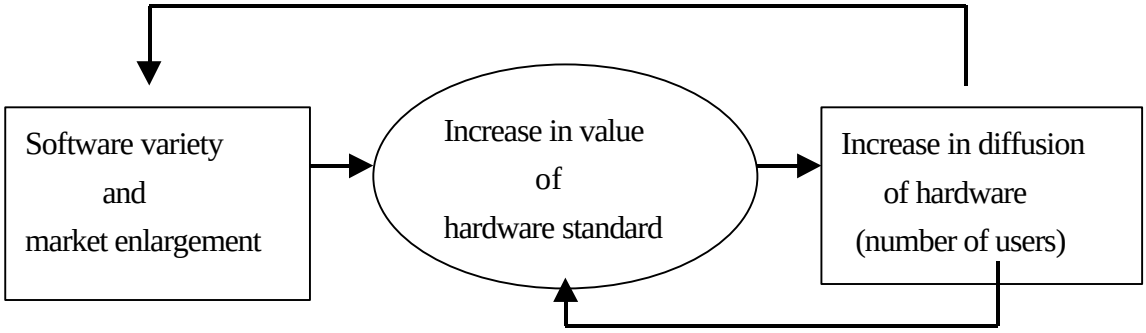
<A Virtuous Cycle Between Hardware and Software>

In this section the interdependency of home video-game hardware and software is examined.

The complementary nature of hardware and software is obvious. Should either one be found to be lacking in some way, users are unable to enjoy themselves. This fact, combined with the mutually incompatible nature of home video-game platforms, creates an environment

which tends toward virtuous (or vicious) cycles between hardware and software. The presence of such cycles is considered a key factor in estimating the future prospects of a particular platform.

In general, when two complementary products are strongly interdependent, cause and effect relationships exist in both directions. For example, with home video-games, high hardware diffusion rates cause software developers to become relatively more optimistic about a platform. When a platform is perceived in this way, there is a tendancy toward greater software variety as more firms seek to develop software for the platform. Similarly, a broad and varied software market is enticing to potential users and thus contributes to greater hardware diffusion. When one side of this relationship begins to advance, it pulls along the other side. Over time the two sides alternately pull each other forward forming a virtuous cycle of good game title variety, software market enlargement, and greater hardware diffusion. Naturally, the cycle can work in the other direction as well. In such cases, neither side contributes positively, and the result is a vicious cycle of waning hardware diffusion, poor software variety, and a stagnant software market. The virtuous cycle mechanism is illustrated in the following diagram.



Due to incompatibility across video-game platforms, the virtuous cycle described above has the potential to exist separately for each individual hardware/software combination. In fact, the mechanism has been observed to work independently for each hardware platform and has exerted no small influence on the business results of platform manufacturers. There is full recognition of the reality of this mechanism by both outside market observers and industry insiders. As should become clear in part three of this case, the experience of the American firm, **Atari**, and the Japanese firm, **Nintendo**, serve as vivid examples of the impact the virtuous/vicious-cycle mechanism can have in this industry.

Firms in the home video-game industry, each recognizing the importance of generating a virtuous cycle, work hard to produce this effect among their products. Hardware firms in particular sometimes go to extreme measures in the pursuit of a virtuous cycle. For example, a hardware manufacturer may itself supply specific game titles which look to lead to

greater hardware diffusion. Hardware manufacturers may also keep the price of a game machine exceptionally low in the period just after its release in order to boost both market share and lay the groundwork for good cumulative sales of a platform.

By laying the foundations for a virtuous cycle between hardware and software, hardware manufacturers increase the appeal of a game platform to software manufacturers. This permits a manufacturer to increase the likelihood that its machine will become the de-facto standard in the industry. With the same goal in mind and to make it easy for software firms to develop games for a specific hardware format, hardware manufacturers often generously supply game development environments and computer equipment to partner software firms.

<Competitive Conditions>

This section examines the firms which make up the home video-game industry and describes the industry's competitive environment.

In 1995, the Japanese market for home video-game hardware stood at approximately 160 billion yen ($1.5 billion). Total sales in the software market for the same year were about 490 billion yen ($4.5 billion). The two markets combine for a total of 650 billion yen ($5.9 billion). (See Figure 1.) In the United States for the same year, the size of the hardware market was $1.5 billion and the software market stood at $6.4 billion, giving a combined total of $7.9 billion dollars. Europe's market, while not as large as that of Japan or the U.S., is also a significant strategically competitive location.

The total worldwide home video-game market comes to about 2 trillion yen ($18 billion). The market has experienced rather steady growth in Japan since it first became established in this country around 1983, though this trend has weakened in recent years. Hardware supply both in domestic and worldwide markets is dominated by Japanese companies, with **Nintendo** as the leading firm. Japanese companies also have a major presence in worldwide home video-game software markets.

The twelve firms presently engaged in the selling of home video-game hardware in Japan are: **Nintendo**, **Sega Enterprises** (hereafter referred to as **Sega**), **NEC Home Electronics** (a subsidiary of **NEC-HE**reafter referred to as **NEC-HE**), Matsushita Electronics (also known as **Panasonic**), **Sony Computer Entertainment Incorporated** (a subsidiary of **Sony**, hereafter referred to as **SCEI**), **Sanyo Electronics**, **Pioneer**, **SNK**, **Bandai**, **Hitachi**, **Victor Japan** (also known as **JVC**), and **Yamaha**. When the industry was in its emerging stages in Japan, between 1981 and 1983, eleven separate firms independently introduced home video-game hardware. All of the products introduced were based on mutually incompatible technology standards. Of these eleven firms however, only **Nintendo** emerged from the

industry's start-up period with a significant share of the market. Due in part to its initial success, over the subsequent ten years which followed, **Nintendo** supplied its hardware products to the home video-game market from a near monopoly position. During this decade, **Nintendo**'s competitors such as **Sega** and **NEC-HE** were unable to capture a large enough share of the Japanese market to pose much of a threat to **Nintendo**'s dominant position. Since 1994, however, the attractive future and high profit potential of the home video-game industry has led nine new firms to enter the market. In addition, the firms which have been active in the industry for a long time have also stepped up their competitive efforts by investing heavily in new hardware platforms. As a result, the industry has been experiencing a period of heightened competition over the past few years, a situation which continues to the present.

Although the twelve firms listed above are all involved in one way or another in the sale of video-game hardware, their stances differ greatly. The various firms can be divided into two groups: a) those firms that promote their own independent technology standard, and b) those which do not. It goes without saying that the firms of the former group play much more important roles in the industry. The firms of this first group are: **Nintendo**, **Sega**, **NEC-HE**, **SCEI**, **Pioneer**, **Bandai**, **SNK**, and **Matsushita** Electronics[3]. From the standpoint of market share, the first four firms in the above list plus **Matsushita** are the central firms in the hardware market.

What then are the market positions occupied by these firms? In Figure 2 this question is addressed by comparing unit shipments data of the various firms. As is clear from the graph, since 1983 **Nintendo** has by far held the dominant share of the market. Nevertheless, because of new market entry and the flurry of new product introductions described above, in particular due to the advances of **SCEI** and **Sega**, the distribution of market share in the industry has changed dramatically recently.

A statistic of equal importance as that of annual unit shipments is cumulative unit shipments. (See Figures 3 and 4.) Cumulative figures are important because for software firms these numbers represent the potential demand of a particular platform. The larger the cumulative figure, the easier it is for a virtuous cycle between hardware and software to develop. The cumulative unit shipment numbers reinforce the perception of the overwhelming position occupied by **Nintendo**'s Famicom and Super Famicom platforms. On the other hand, for these two products, especially the former, the fact that a number of years have now gone by since they first appeared in the market is significant. The actual number of machines of these

---

[3] **Matsushita** has developed its product based on a game platform first created by an American firm, 3DO. However, since **Matsushita** is the sole promoter of this standard in Japan, the firm is also included in this first group of firms.

older models which are still in use is likely to be lower than the figures suggest. The good performances of the more recent machines of **SCEI** and **Sega** have improved the industry positioning of these two firms vis-à-vis **Nintendo**. As a result, **Nintendo**'s large market share lead is now shrinking.

The home video-game software market is analyzed in the next few paragraphs. Unlike the hardware market, there are a great many firms active in supplying software to the home video-game market. Some of these firms are like **Nintendo**, which in addition to manufacturing hardware also design and sell software. Other firms have specialized in only making software and do so underlicenses from hardware manufacturers. A conservative estimate of the number of firms producing home video-game software is about 200 to 300. The average estimate puts the figure at about 500 firms.

Firm size and diversification vary greatly within this large group of firms. Some firms have over 1000 employees and sales in the hundreds of billion of yen (billions of dollars). Others consist of no more than a few employees working together out of someone's apartment.

On top of firm size, there is also much variety in business content among firms which produce software for the home video-game market. There are some firms which create products exclusively for home use, while other firms also develop games for use in video arcades. Some firms even engage in the actual management of the amusement facilities where video-arcade games are played, in addition to producing the video games themselves. Then there are firms for which software development is just one segment of a diversified portfolio of entertainment businesses. For some firms video-game development complements the development of computer software for business use. Other firms supplement their software production business with the manufacture of toys or movie production.

Greater variety of viable hardware platforms and overall market expansion has given rise to much entry into the sortware market in recent years. No longer is the software market essentially confined to Japanese firms either, as market entry by foreign companies has become increasingly common. The trend in the software market seems to be one of an ever larger number of firms with growing variety among them.

Software firms conduct their business by signing contracts with single or multiple hardware manufacturers. They then write and sell software to run on the platform(s) sold by these manufactures. (Hereafter such software firms will be referred to as "third parties" or "licensees.")

The market shares of the major software firms can be found in Figure 5, however this data should not be given too much weight. Huge differences in sales per game coupled with the fact that most firms release new games somewhat infrequency, means that the business results and market shares of the various software firms are frequently changing. (This variation is

mitigated to some degree for the firms in Figure 5 because of their large sizes.)

Nintendo and **Sega** are two firms which have consistently released many hit game titles, and thus have been able to maintain big shares of the software market. **Nintendo**'s success has been historically established as it has developed a long line of successful game titles since the early stages of the industry. **Sega**'s success is an extension of its long-time experience developing video-arcade games. The roles these two firms play in the software market, in addition to improving their profits, also contribute to the diffusion of their respective hardware platforms. Since increased software sales and the licensing revenue this brings is the single best way for a hardware manufacturer to increase its profitability, the various hardware manufacturers do their utmost to design policies which enable them to reap profits from the software side of the market. As a consequence, when attempting to assess the business success of the hardware manufactures, it is critical to look at the amount of software bought and sold for each platform. (See Figure 6.)

While the above paragraphs detail the current state of the home video-game industry, of course this situation did not develop overnight. Rather it is the result of the unique history of the industry which has been developing over the past 15 years. The next section of this case examines this history to explain how the current situation came to be as it is.

3. Home Video-Game Industry, Period 1

<The Pre-Home Video-Game Era>

Prior to looking at how the Japanese home video-game industry developed, the industry's roots in the United States need to be examined.

Video-games were born in the 1950s and 1960s in research centers and universities in the U.S. which were equipped with large-scale computers. The computer games were created for the simple purpose of having fun. Given the limited capabilities of computers of that day and the difficulty in using them, the games created were necessarily quite rudimentary. However, the most interesting thing about these games is that many of them were more than the simple straight computerization of games which already existed in a non-computerized form. At this early stage in their development, computer games were created and used only by a very select segment of the population, namely the users of big mainframe computers. The games generally were distributed for free via personal contacts and through trade magazines.

Following this initial stage and strongly influenced by rapid technological advancement, the commercialization of computer games proceeded in two separate directions both of which developed into viable business opportunities. The first direction produced computer games which ran on multipurpose personal computers. The second direction was one in which dedicated arcade-style game machines came to be placed in bars and other places where large numbers of people gathered. Video games of this type became a source of revenue for owners of such establishments. It is the latter stream of games, that of the video-arcade machines, which is more closely related to what would later develop into the home video-game machines seen today.

One of the first firms to turn the video-arcade game format into a viable commercial product was an American company, **Atari**, established by Nolan Bushnell in the early 1970s. Large numbers of people in the general population were introduced to the computer game phenomenon through the arcade machines produced by this firm. The success this initial venture by **Atari** together with ongoing technology advancement led to the idea of putting the games directly into people's homes and the recognition that there would likely be a large market for such an innovation. It was in response to this market opportunity that in 1972 a number of firms began making and selling home video-game machines.

Building on the success it had achieved in video-arcade games, **Atari** entered the home video-game market, although it didn't do so until 1977. It was in this year that **Atari** put on-sale the Atari 2600 machine. About three years after its first sale, the Atari 2600 rapidly began to emerge as the market leader of a fragmented, but growing, market. By 1982, the overall home video-game market had exploded to more than $3 billion. By this time cumulative sales of the Atari 2600 exceeded 10 million units. As many as 1500 game titles

were available for the game platform. Behind this blazing growth was **Atari**'s extremely open software policy. Each year hundreds upon hundreds of new software titles were released creating a powerful virtuous cycle between hardware and software (This mechanism is described in detail earlier in this case.)

The extraordinary growth and prosperity of the early home video-game market and of **Atari** itself were remarkably short lived. As early as the 1982 Christmas season, Atari 2600 sales and that of its software began to fall off dramatically. The rest of the home video-game market experienced a similar rapid decline. Before long the market had shrunk to a mere 1/30th of its peak size. The main factor responsible for this dramatic market shrinkage, referred to in Japan as the "**Atari** Shock," was the lack of any extremely popular games and a sharp increase in games of very poor quality. Thus, the interest of both game users and store owners faded. The parent company of **Atari**, the large diversified entertainment firm, Warner Communications, has also been criticized for its management of **Atari** which many view as having contributed to the rapid cooling off of the market.

The precipitous decline of **Atari** and of the entire home video-game market virtually extinguished all interest in the home video-game market U.S. firms. Instead, the computer game industry's center shifted to video-arcade games and to video games for personal computers. The **Atari** example impressed upon the minds of both industry observers and participants the tremendous potential and the lurking dangers of the computer game industry. The case also made clear the critical importance of the software dimension of the industry. As will be elaborated later, **Nintendo** is an excellent example of a company which benefited greatly from the lessons of the **Atari** experience.

The industry movements in America and the blossoming of the Japanese video-arcade game market both profoundly influenced the establishment of a home video-game market in Japan. In particular, the sensation in Japan created by the huge arcade hit, Space Invaders, which was released in 1978, deeply affected the development of the domestic home video-game industry. Due to the surprisingly widespread success of this arcade game, what had previously been a niche market suddenly was cast into a much broader social sphere. Accordingly, this wider potential user base made possible more varied success paths for the entertainment medium. A number of corporations, inspired by the great success of Space Invaders , began producing and selling Space Invaders machines or creating other arcade games of a similar nature. Piece by piece, capital and know-how steadily accumulated within the industry.

Following the groundwork laid in the late 1970s, by 1981 a number of firms had started selling their own independent lines of home video-game hardware. Two years later in

1983, there were over 10 separate hardware standards coexisting in the market. Of these early movers, only **Nintendo**, with its Family Computer (Famicom) machine, emerged as a success, and it did so to such a extent that the firm came to dominate the market with virtual monopoly power for years to come.

<History of **Nintendo**>

Nintendo's corporate roots stretch back as far as 1889. The company later changed its name to **Murufuiku, Nintendo Karuta**, before settling on simply, **Nintendo**. The firm's business began with the production and sale of Japanese and Western-style playing cards. By adorning its cards with pictures of famous personalities and comic characters, the firm successfully generated a demand for its product among regular everyday families. The firm also paid special attention to nurturing close corporate relationships with the distributors of its products. Primarily by exploiting these two avenues the company managed to become the top manufacturer of playing cards in the market, a position which it holds to this day.

It was in the 1960s that the firm began to change into the **Nintendo** known around the world today. During this time a number of executives of the firm, beginning with third generation company president, Mr. Hiroshi Yamauchi, came to the conclusion that the future prospects of the playing card market were unsatisfactory. The executives began to search for new markets in which the company could participate. What attracted their attention the most was the rapidly developing technology of consumer electronics. The firm embarked on a mission to somehow incorporate these new technologies into its current business, which it viewed as the manufacture of amusement goods.

With the future direction of the company decided, the firm began to redirect the capital it earned from its playing card business into the accumulation of technological skills in electronics. Around 1965, the firm began to hire graduating university students who had science and engineering backgrounds. The results of **Nintendo**'s new investment policy began to become apparent in the mid-1970s, but the real fruit of the firm's labor came in the 1980s as **Nintendo** assumed leadership of the home video-game industry.

Nintendo's first experience in the computer game industry came in the arcade-game boom of the late 1970s. **Nintendo** created and sold arcade games which were loose imitations of the mega-hit, Space Invaders. **Nintendo**'s first big successes in the market were the arcade-games, Donkey Kong in 1981, and Mario Brothers put on-sale shortly thereafter. During these years of arcade-game production, the firm built up vital know-how in the development of computer game software and established a reputation with consumers as a successful game maker. (In spite of this success however, it was not long before **Nintendo** withdrew from the

arcade-game-market.)

While experiencing success in the arcades, **Nintendo** also produced and sold hand-held electronic games which doubled as timepieces. **Nintendo**'s participation in this market occurred at the time **Casio** and **Sharp** were holding a price war in the calculator industry. The intense competition between these two firms kept bringing down the price of the liquid crystal displays and integrated chips commonly found in calculators. **Nintendo** took advantage of the excess production capacity of the calculator manufacturers to produce its hand-held electronic games at low costs. The products themselves, no larger than audio cassette tapes, came with a built in LCD and pre-installed software. Generally the software was not interchangeable, and the games were of a "one hardware, one software" format.

These hand-held games provided **Nintendo** with a solid stream of revenue. Their impact on **Nintendo**, however, extended well beyond just short term profits. The products marked another major step forward in **Nintendo**'s movement away from its traditional playing card focus and toward the computer games which have since become so central to the company. The production of hand-held games also provided a mechanism by which the firm could move its corporate capabilities toward the research and development of both the hardware and software of computer games. Furthermore, the experience gave the firm new skills in the management of intellectual property rights as it struggled with imitation products. In this way, **Nintendo** learned first hand about the peaks and pitfalls of the product royalty business. **Nintendo** became especially aware of how a glut of copycat products can eat away at the profits of a market leader.

As outlined above, **Nintendo** step-by-step accumulated the resources it needed to succeed in the home video-game business. In addition, the firm had the "quick growth-rapid decline" experience of **Atari** in the United States from which to learn, and it could formulate policies to avoid such an outcome in Japan.

<The Success of **Nintendo**'s Family Computer (Famicom)>

Beginning with **Epoch**'s Cassette Vision which went on-sale in November of 1981, there was a period of about two years in the early stage of the home video-game industry when a large number of mutually incompatible hardware standards poured into the market. As is to be expected in such an emerging industry scenario, the new market was rather confused. Performance and price varied greatly depending on the product. The performance of home video-game machines can be gauged by comparing central processing units (CPUs). During this initial two year period, machines could be found with CPUs which ranged from 4-bit to 16-bit, the latter comparing favorably with the higher-end PCs of that day. The shapes and

functions of the home video-game machines also spanned a wide range. Some units were dedicated game players while others could be described as part personal computer, part game machine. Prices also varied a great deal, ranging from 15,000 to over 60,000 yen ($135-545). Among the manufacturers of these machines were a number of firms which specialized in making toys. There were also a number of computer firms searching for a foothold in this emerging high-tech market.

Atari's experience in the U.S. and the boom in the Japanese arcade-game industry convinced game machine manufacturers that the central pillar of the industry would likely be young adolescents. Youths were especially enamored with lower priced 'single hardware-multiple software' machines. Although there was a general consensus among manufacturers as to the importance of this youth segment of the market, there was far from a shared understanding on the factors needed to succeed in this market. Each firm based its emerging-market strategy on its own individual corporate image and managerial resources.

As for the other sides of the market, namely software and product distribution, there wasn't much conviction that a sustainable home video-game market would ever emerge. Software and distribution firms looked to read the judgment of consumers as to which platforms would survive (if any) before committing to a particular hardware platform or manufacturer. Wait-and-see attitudes such as these compelled hardware manufacturers also to be responsible for supplying the software for their machines. Thus in this early stage of the market, hardware firms generally had to compete with each other on their own, without the help of any allied firms. Only **Nintendo** was able to emerge victorious from these difficult market conditions; it did so with its Famicom system.

Nintendo was a late entry into the emerging home video-game market and did not begin selling its Famicom machine until July of 1983. When sales of Famicom began, **Nintendo** was unremarkable compared to its competitors both in technological capability and firm size. Despite this lack of distinction, however, **Nintendo** eventually would come to completely dominate its rivals and almost single-handedly establish the viability of the home video-game market.

In the first six months after Famicom went on-sale, 440,000 units were shipped which quickly gave the platform a 40-50% share of the market. Sales grew at an even faster pace over the next two years, before peaking in 1986 at 3.9 million units. (See Figure 2.) By the end of that year, cumulative sales had reached the 10 million level. The cumulative total would exceed 15 million units before production of the platform ceased. During its first seven years the home video-game industry as a whole grew at an average annual rate of 140%. It is not an overstatement to say that it was the popularity of **Nintendo**'s Famicom system which was largely responsible for the successful emergence of the entire industry.

What were the main reasons for **Nintendo**'s success? The following paragraphs examine three major factors.

First, great games. Title after title of excellent software for the Famicom platform hit the market in rapid succession. This feat was achieved even though during Famicom's first year, only **Nintendo** itself was supplying software for the platform. When the hardware first went on-sale **Nintendo** released three games, and new software was put on-sale at a rate of one or two titles a month for the next twelve months. Among these early game titles was the home version of the smash arcade hit, Donkey Kong, as well as other popular games like Baseball, Tennis, and Five in a Row which were written specifically for the Famicom standard.

These new games, while fairly simple in design, held enough entertainment value and took well enough advantage of the video-game medium to generate strong interest in the young adolescents who formed the core of the market. A broad selection of games also contributed to the platform's success as it attracted the attention of a wide variety of young people. As highlighted before, the result of **Nintendo**'s strategy was the rapid diffusion of its game platform in a short period of time.

After the first year of software sales, it began to become clear that **Nintendo**'s hardware would likely emerge from the early market chaos as the industry leader. A number of software firms began to recognize the great market potential of software for the Famicom sysytem and looked to undertake market-penetration strategies. One by one these firms came to **Nintendo** seeking licenses to write games for the Famicom platform. (See Figure 7.) Among these first suitors were software firms which had previously achieved their success in the arcade-game market. The new entrants included: **Namco**, **Hudson**, **Konami**, **Jaleco**, and **Taito**.

With the added strength of these proven software firms, the string of great Famicom games continued. Some of the bigger hits included: Road Runner (**Hudson** - 1984), Galaxia (**Namco** - 1984), Super Mario Brothers (**Nintendo** - 1985), Dragon Quest (**Enix** - 1986, later a popular series), and Final Fantasy (**Square** - 1986, also later a popular series.) The virtuous cycle between hardware and software worked at full strength, as both hardware and software unit shipments soared, and the home video-game market became firmly established.

The second main factor which explains the success of **Nintendo**'s Famicom system was the firm's superb design of its hardware. In order to appeal to the adolescent youths **Nintendo** targeted as its core user group, the firm strove to develop a machine that could be produced at an extremely low cost. In order to achieve this goal, **Nintendo** narrowed the focus of the platform to the sole purpose of playing games.

During the platform's development, **Nintendo** relentlessly cut costs. Everything which was not absolutely essential for good game playing was kept out of the machine. Yet at

the same time, **Nintendo** was careful to avoid making major sacrifices in the core functions of the machine, namely its graphics and sound capabilities. A great aid to **Nintendo** in achieving its target of a low cost, high performance machine was the cooperation that existed within the firm between its hardware and software divisions. Good teamwork allowed **Nintendo**'s in-house game designers to push the graphic and audio capabilities of the Famicom machine to its limits. Largely through such efforts **Nintendo** managed to get away with using a surprisingly unremarkable and inexpensive 6502 chip for Famicom's CPU. The firm also kept costs down by choosing not to equip the machine with a keyboard or other 'superfluous' peripherals. Even the joystick of the machine was a radical innovation designed to keep down costs.

The Famicom machine fell far short of what multipurpose home computers of the day were capable of doing. Yet, the machine was inexpensive and sufficiently capable of delivering enjoyment to its users. The machine's affordability supported the virtuous cycle between the platform's hardware and software by broadening the base of the machine's users.

The third factor contributing to Famicom's remarkably successful launch and subsequent strikingly rapid growth was the skill with **Nintendo** managed its relations with product distributors in the industry. **Nintendo**'s success in this area came largely from the firm's already established position as a major toy manufacturer. Thus, even before **Nintendo** began producing for the home video-game market, the firm was already on close terms with the industry's major wholesalers. **Nintendo**'s close relationships in the industry extended to a good working relationship with the main association of wholesaler businesses in the toy industry, an organization called, Shoshinkai. This association plays a major role in the industry and was formed to promote friendly relations between industry participants.

Nintendo's established corporate connections enabled the firm to enter the home video-game market already in possession of fixed distribution channels. **Nintendo** used this resource to get its product onto store shelves. **Nintendo**'s ability to get its product to consumers was especially significant because the firm was able to use these channels to overcome the difficulties it faced by being a late mover in the industry.

<**Nintendo**'s Market Conduct and Power>

Behind the great success of Famicom and **Nintendo**'s near monopoly position lay the firm's careful and steady advances in its control of the market. By cleverly taking advantage of the unique characteristics of the products of the home video-game industry, **Nintendo** was successfully able to put each of the various firms with which it did business under some form of its own control. By wisely exercising the control it cultivated, **Nintendo** avoided the type of market destruction which had been seen in the United States. Naturally, **Nintendo**'s market

control also helped the firm protect and sustain its own high profits.

Nintendo's superior market positioning began to take shape in 1984 when software firms first turned their attention toward the Famicom platform because of its rapid market diffusion. Each software firm sought a piece of the growing pie which Famicom's rapidly expanding user base represented. However, **Nintendo** required these software firms to meet a number of conditions before granting them the permission and technology access they needed to produce games for the platform.

Nintendo was under intense pressure from these software firms as it struggled to decide how to cope with the many requests for access to the Famicom platform. Should **Nintendo** reject the requests, it would remain the platform's sole supplier of software and be forced to continue to perform this critical function on its own. Given the rapidly expanding home video-game market, it would likely become increasingly difficult for **Nintendo** to persevere over its rivals all by itself. Yet, on the other hand, granting permission to the software suitors carried its own high risks. For one, **Nintendo** would create competition right where the firm planned to make its big profits, namely in the selling of software. Secondly, by opening up the software market, **Nintendo** ran the risk of producing the same kind of software market chaos which had doomed **Atari** in the U.S. As will be described below, **Nintendo** sought to resolve its dilemma through a conditional opening of Famicom's software market.

On the hardware side of the platform, **Nintendo** chose to keep its monopoly and remain the sole supplier of Famicom machines. Software was opened to those firms which agreed to sign licensing contracts with **Nintendo**. Firms without such contracts were prevented from making and selling Famicom games by two means. First, there were legal barriers, such as commercial laws, patent restrictions, and copyrights. Second, **Nintendo** further protected Famicom's software by manufacturing a technological obstacle into its products, in the form of a security chip attached to its game cartridges.[4] **Nintendo** devoted a lot of attention to creating obstacles to prevent unauthorized software production. Furthermore, through skillful negotiation, drafting, and enforcement of contracts **Nintendo** strengthened its power position vis-à-vis firms selling software for its hardware devices.

The licensing contracts **Nintendo** signed with software firms covered a broad range of issues concerning production and sales, and in time were expanded to include clauses for

---

[4] The security chip is a special chip which must be built into Famicom software units. Unless the Famicom hardware detects the presence of the special chip, the machine is unable to read the game. Originally designed to prevent the illegal copying of software, the chip, which was manufactured only by Nintendo, gave the firm an additional means for controlling the sale of Famicom software. Other hardware manufactures also use devices similar to Nintendo's security chip to protect their software and enhance their control of distribution.

controlling software content (particularly of adult or violent nature.) **Nintendo** performed the actual manufacturing of the game cartridges and required software firms to agree to a number of conditions: a) a minimum order of 10,000 units per title, b) full payment in advance, and c) that the software firm would take full possession of the entire order upon its completion. The royalties and manufacturing fees charged by **Nintendo** generally made up about 40% of the list prices charged to consumers.[5] **Nintendo**'s control over software for Famicom was further elevated by the close relationship **Nintendo** has with Shoshinkai, the association of game wholesalers which controls much of the distribution in the industry.

As the video-game market developed from its initial stages, software firms increasingly found themselves under **Nintendo**'s control.

Nintendo's dominating position in the market continued for some time, and as a consequence the firm was successful in preventing a collapse of the software market and preserving its own high returns. Royalties and manufacturing fees supplied the firm with a steady stream of revenue. Third-party software complemented **Nintendo**'s own software and sales increased all around. Thus, **Nintendo** succeeded in implementing its original strategy to make break-even or worse returns from its hardware sales and to make its profits from the software side of the market. **Nintendo** eventually was even able to exert influence over the contents of the third-party software as well. This measure of control provided the company with a means to guard against the poor quality and over-supply which had so severely damaged the U.S. home video-game market.

As long as **Nintendo**'s market share remained dominating, software firms and distributors were content with the status quo as they too earned good returns on their investments. As a result, the market structure outlined above continued with only minor alterations for quite a few years. Other hardware manufacturers continued to attempt to differentiate their various platforms from **Nintendo**, but were unable to alter the basic direction in which the industry was heading under **Nintendo**'s guidance.

---

[5] Nintendo set its manufacturing fee above the actual costs it incurred for production. The extra amount was charged as a royalty fee for the use of Nintendo hardware as the basis upon which a software firm conducted its business. Nintendo is not the only firm to charge such a royalty fee, although other firms call the fee by different names and charge different amounts. As will be explained later in this case, additional fees are sometimes charged as well. For expample, SCEI charges a fee for software distribution. Nintendo also imposed limits on the number of different titles which could be sold per year. (Note: The conditions imposed by Nintendo listed above come from an early stage in the industry's development and have changed extensively as the industry has evolved.)

4. Home Video-Game Industry, Period 2

<The Market Entry of **NEC-HE** and **Sega**'s New Game Platform>

Following steady growth since it first went on-sale, sales of **Nintendo**'s Famicom peaked in 1986. After this year, annual hardware shipments dropped, sales per title also fell (total game sales continued increasing marginally), and market expansion slowed. (See Figure 7.) At the same time, technological changes under way outside of the immediate home video-game market captured the attention of both video-game manufacturers and users. Better and better technology began working its way into the video-game industry. The more advanced technology first appeared in video-arcade games, and later became increasingly common in products intended for home use.

It was at this time that two firms sought to use this technological advancement as an opportunity to break into the **Nintendo** dominated market. The firms were **NEC-HE**, a subsidiary of major computer manufacturer NEC, and **Sega**, the top firm in the arcade game market.

NEC-HE was the first to move, putting its home video-game machine, PC-Engine, on-sale in 1987. Soon after in the following year, **Sega** released a home-use machine, Megadrive. Two years later, in 1990, **Nintendo** began selling its own next generation home video-game machine, Super Famicom.

With an all-new group of mutually incompatible game machines in the market, competition in the industry began anew.

<History of **Sega**>

This next section focuses on **Sega** and examines the major role this company has played in the home video-game market.

Sega was formed in 1965 when Service Games Japan acquired Rosen Enterprises. Service Games Japan was a firm experienced in the manufacture, selling, and financing of amusement machines, having begun business in Japan with the post-war importation of juke boxes. Rosen Enterprise was also well established and participated broadly in the commercial amusement machine industry. Thus, the merged company had capabilities in many areas, including experience the operation of amusement facilities, such as bowling alleys. As a result, from its inception in 1965, **Sega** held the position of the leading company in the commercial amusement machine industry.

Beginning in the early 1970s, a profound change occurred in the amusement machine industry as machines moved from a mechanic to an electronic base. **Sega** was rather late in making this switch and for a time looked as if it might lose its top position in the industry to

rival firm Taito, maker of Space Invaders, or **Namco**, creator of Pac-Man. **Sega** reasserted itself as the industry's leading firm, however, through the firm's successful internal restructuring of the mid-1980s. It was during this time that the firm rapidly acquired and applied computer technology to its amusement machines. The corporate reorganization of the firm began in 1984 under the direction of newly appointed president Hayao Nakayama, who came to work at **Sega** through the firm's acquisition of Esuco in 1979. **Sega**'s leading position in the commercial amusement machine industry continues through today.

The company's long-standing corporate strength is not simply the result of some vague historically steeped tradition, but rather has its roots in the adept strategic moves the firm has consistently made over the years. **Sega** actively incorporated into itself the new technology necessary for the development and manufacture of a whole new genre of 'experiential' games involving three dimensional computer graphics and action whereby the actual physical body of the user is involved in playing the game. The firm has also pursued expansionary policies and an increasingly family-orientated environment in its amusement facilities. As a result, the image of such establishments held by consumers has improved dramatically over the years. **Sega**'s conduct in the industry has been a major driver of the entire amusement game market and has produced a variety of new business opportunities for the overall industry.

Given **Sega**'s history, technological capabilities, and its innovative spirit, it is understandable that the firm would seek to take advantage of its corporate resources in the home video-game market. In fact since 1983, **Sega** has been developing and selling both hardware and software in this market. During these initial years, however, the firm was not able to stand up to the tough competition of **Nintendo**. **Sega** did manage to achieve first year shipments in 1983 of 200,000 units, spread between two hardware platforms. **Nintendo**, on the other hand, sold 440,000 Famicom units in this same year, and increased its lead over **Sega** each year thereafter so that by 1986 an enormous gap of 3.6 million units shipped a year existed between the main hardware products of two firms.

Sega's market introduction of Megadrive in 1988 can be viewed as more than just the release of a new product. The firm sought to use its new game machine to build for itself a major position in the market and knock **Nintendo** out of the market's leading spot. Accordingly, Megadrive went on-sale amid high expectations.

<Strategy of Each Firm and the Attributes of the New Products>

In the most basic sense, the products introduced by **NEC-HE** and **Sega** in 1987 and 1988 respectively, had the same objective. Both firms saw the success of **Nintendo**'s Famicom as coming from a powerful combination of superior hardware and excellent, diverse software.

Likewise, both firms sought to compete with **Nintendo** on these two fronts and deliver to the market the successor to the Famicom system.

From the hardware development stage, **NEC-HE** formed a strategic alliance with software firm **Hudson**, as a step toward establishing a full line of game titles for its machine. The CPU for **NEC-HE**'s hardware was of the same 8-bit format as Famicom, but the new machine had a higher clock-speed giving it improved processing power. The machine also had a dedicated LSI chip for image and audio processing. The result was a game machine which greatly improved upon the incumbent in terms of hardware capabilities.

Sega set its sights slightly higher than **NEC-HE** and incorporated into Megadrive a 16-bit processor. At the time, such chips were the common CPUs of arcade machines. Thus, **Sega** was able to achieve a major leap in on-screen graphic speed and smoothness. The firm, not wanting to limit the software market for its platform to only itself, worked hard to interest other software firms in developing games for the platform. **Sega** kept its licensing fees low and undertook other measures to assist firms which signed licenses to create software for Megadrive. Even while trying in this way to attract cooperating firms, **Sega** capitalized on its strength in the arcade-game market by actively transferring its already popular games to the Megadrive platform.

In addition to the policies outlined above, **Sega** also put great effort into software development for products to be sold exclusively in the home video-game market. A byproduct of this effort was a new game, Sonic the Hedgehog, which came to symbolize **Sega**'s renewed challenge to **Nintendo**. The game was released by **Sega** in an attempt to generate the same kind of hardware-software synergy that **Nintendo** had achieved with its Super Mario Brothers game.

Nintendo's response to the challenges posed by **NEC-HE** and **Sega** began in September of 1987. It was then that the firm announced that in 1988 it would begin selling its own 16-bit next-generation home video-game machine. **Nintendo** missed its own self-imposed deadline by nearly two years, and the new machine, Super Famicom, didn't go on-sale until November of 1990. Due in part to this long delay, the new machine was more technologically advanced that its two competing platforms.

Nintendo did not make Super Famicom backward compatible with Famicom primarily due to cost limitations. Thus, **Nintendo** was unable to provide its current users with a completely painless switch to the new platform. **Nintendo** attempted to make the switch easier and make the new machine more appealing to customers by releasing a number of popular game titles, such as Super Mario World, to coincide with the market release of the new hardware. Other software firms soon followed **Nintendo**'s lead and a succession of new games for the Super Famicom platform rapidly entered the market once the hardware was put on-sale.

<**Nintendo** Reigns Again>

This section contrasts the results achieved by the various hardware manufacturers with the strategies pursued by each firm.

Sales of both **NEC-HE**'s PC-Engine and **Sega**'s Megadrive grew steadily until 1990 when **Nintendo**'s Super Famicom went on-sale. Once **Nintendo** began selling its new machine however, these rival platforms both experienced sales drops. The challengers sought to renew interest in their machines and boost their product differentiation by introducing peripherals such as an attachable CD-ROM drive, but were unable to halt the sales declines which had begun when Super Famicom first went on-sale.

In sharp contrast to **Sega** and **NEC-HE**, sales of **Nintendo**'s Super Famicom soared. In the final two months of 1990, **Nintendo** shipped over 660,000 units of its new game machine, and in 1991 annual shipments reached 3 million. Even though annual sales stopped increasing in 1993, they still remained well above the 1 million mark. In total, cumulative sales for the platform have come to more than 16 million, just short of the amount attained by the original Famicom. (See Figures 2 to 4.) **Nintendo**'s relatively late release of Super Famicom did not seem to hamper the platform's sales. **Nintendo**'s acievement of two consecutive major successes in the hardware market removed any doubts about the appropriateness of the firm's top position in the industry.

Nintendo was able to dominate the market a second time due to the policies the firm undertook in this new round of competition

First, even before the new product went on-sale, **Nintendo** leveraged the market success of its current product, Famicom, by announcing very early on that it would soon begin selling a new and improved hardware platform. **Nintendo** sent this market signal to its users, distributors, and third-party software firms at such an early stage to encourage them to remain loyal to the firm and not to defect to the standards of the new market entrants. **Nintendo** hoped that building high expectations for its new platform would make switching away from the company's products more difficult.

The large pent-up demand for Super Famicom was evident by its explosive market diffusion when it went on-sale at the end of 1990. Rapid sales of the Super Famicom system were fueled by migration of Famicom users to the new platform. As mentioned before, the new machine's markedly superior features and performance together with **Nintendo**'s release of a number of popular new game titles, such as Super Mario World, gave consumers powerful incentives to purchase the new hardware.

Software firms and distributors quickly joined users in supporting the new platform. A string of popular games, some created by **Nintendo** and others by third-party software firms, kept the momentum of the new platform going. The hit games included: Final Fantasy IV (**Square** - 1991), The Legend of Zelda (**Nintendo** - 1991), Street Fighter II (**Capcom** - 1992), Super Mario Kart (**Nintendo** - 1992), Dragon Quest V (**Enix** - 1992), and Final Fantasy V (**Square** - 1992). **Nintendo**'s ability to support Super Famicom with successful software and distribution policies, two areas which were critical to the original Famicom's success, provided the solid foundation the new platform needed to become the market leader in the second generation of the home video-game market.

Although **Nintendo**'s new machine dominated its rivals with an overwhelming lead in market share much as the firm's first game platform had, competition in the home video-game market following the market entry of **NEC-HE** and **Sega** was different from what it had been in the early and mid-1980s. Since **NEC-HE** and **Sega** had Famicom's success from which to learn, they both had a good idea of what was needed to succeed in the market. The two rival firms used this knowledge in their hardware development and strategic planning. While in the end **Nintendo** again emerged as the market leader, the two rival firms each experienced some temporary success, and for a time their market shares approached that of **Nintendo**.

In the United States the effect of the new competition was even more pronounced. **Sega** began selling its Genesis system (Megadrive in the U.S.) in 1989, and as in Japan it met with good initial market response. However, rather than fading when **Nintendo** released the Super Nintendo Entertainment System (Super Famicom in America), Genesis' sales remained strong and more or less kept pace with **Nintendo**'s new machine. The U.S. market was thus split in two, with half going to **Nintendo** and the other half to **Sega**. Much of **Sega**'s success was due to the great popularity of the firm's flagship game title, Sonic the Hedgehog, which appealed strongly to the American video-game playing public. **Sega** also excelled in its product promotion and distribution in the United States.

In the end, the most significant effect of the second round of competition was it showed that it was in fact possible for firms to mount a challenge to **Nintendo** in the video-game market. Some of the resources that would be needed for such an attack were also revealed. Naturally, in addition to **Sega** and **NEC-HE**, other firms also became aware of this reality in the home video-game market. However, it wouldn't be until 1994 that the next round of hardware competition would begin.

5. The Home Video-Game Industry, Period 3

The third round of competition in hardware for home video-games began in 1994. The trigger for this new round was much the same as it had been in the second round of competition. Due to the ongoing revolution in the basic technology of home video-games, the gap between the current game systems and the potential embodied in new technologies had again increased, though this time the jump was even more dramatic. The arrival of this new technology frontier coincided with a loss of market momentum by **Nintendo**'s Super Famicom, the leading product in the industry.

In this new round of competition, hardware manufacturers used the appeal of exceptional three dimensional graphics (made possible by the use of 32 bit CPUs in the new machines) to convince users that the new technology represented a more robust gererational change than that which had occurred in the late 1980s. Several other unique characteristics distinguished this new competitive environment from what had come before. For instance, firms had a better overall grasp of the fundamental competitive characteristics of the home video-game market and had the examples of **Sega**'s Megadrive and **NEC-HE**'s PC-Engine to use as references. Furthermore, the use of ever more advanced technology in game machines had increased their potential to become devices of a more multimedia orientated nature.

It was thus with high expectations that in the early 1990s many new firms, mainly from the information and home electronics industries, began to execute market penetration strategies for the home video-game industry. (See Chart 1 for a list of the major companies.) This new entry and technological progress raised the complexity level of competition in the industry.

The first mover in the new round of competition was **Matsushita Electronics**. In March 1994, the firm introduced a product, 3DO-Real, which is based on the technical standard of American firm, 3DO. **Sega** was second to introduce a new generation machine putting Sega Saturn on-sale in November of 1994. In December of the same year, **Sony** Computer Entertainment (**SCEI**) released PlayStation, and shortly thereafter **NEC-HE** put on-sale its own new platform, PC-FX. (See Chart 2 for the specifications of each machine.)

So, what were the market results posted by each of the major hardware manufacturers?

Stated in the most general terms, 3DO-Real and PC-FX have fought hard, but have struggled to gain momentum, while Sega Saturn and PlayStation have moved forward quite well. The former two machines were plagued from the start by high prices for hardware and/or machine failures. Additionally each experienced problems with software quality and availability. As a result, it was difficult for sales of both 3DO-Real and PC-FX to take off. Contrasting starkly with these results, have been the successes of the latter two platforms. Sales

of Sega Saturn and PlayStation have expanded steadily and at virtually the same pace. Both reached the 1 million cumulative sales level in May of 1995. By the end of the year, cumulative sales stood at 2 million for each; the figures surpassed 3.5 million by August, 1996. (See Figures 2 and 4.) The main factors responsible for the success of the two platforms can be found both in the product strategies taken by the respective firms and by the fact that each platform had an ample supply of software available for it. (This can be seen in Figure 6 by the significant market shares held by software compatible with each of these two platforms.)

Despite the similarities, Sega Saturn and PlayStation have some important differences between them. **Sega** has been successful largely due to the firm's transfer of many of its own video-arcade hits to the home market. Consequently, the core user group of the platform is made up of those people who are most interested in such reworked arcade games, namely youths who frequent video arcades. **SCEI** on the other hand has sold PlayStation to a wider range of users. **SCEI**'s heavier reliance on the software of a number of different firms has also contributed to the broadening of PlayStation's audience. A more diverse set of users may be responsible for the better diffusion rate PlayStation has achieved over Sega Saturn in the months just preceding the completion of this case.

<The Founding of **SCEI** and the Development of PlayStation>

This section explores the details of **SCEI**, which was formed as a 50-50 joint venture between **Sony** and one of its own subsidiaries, **Sony Music Entertainment**. How was this completely new market entrant able to achieve such good success? The future prospects of the firm are also considered.

Sony's first foray into the computer game market occurred more than ten years prior to the founding of **SCEI**. In the early 1980s, **Sony** cooperated with the American firm, Microsoft, on the MSX standard which, in Japan, had **Ascii** as its main promoter. MSX was developed as a computer standard designed to challenge the then dominant standard in the Japanese market which was championed by NEC, Fujitsu, and Sharp. Several firms in Japan together agreed to support the new MSX standard and use it as the foundation for the development of low priced computers targeted at the home-use market. The goal of this coalition of firms was to use this market segment as a base from which to enter the computer market and gain market share. Although the MSX machines developed by these companies were referred to as computers, they were usually useful for little more than game playing. In essence, however, they were machines which can be described as something in between pure single-purpose home video-game machines and personal computers. **Sony** participated in this market from a very early stage and continued developing products for the market until the

standard itself disappeared due to a lack of interested customers. **Sony**'s direct branded presence in the computer market ended together with the failure of this MSX platform.

It is also important to note that another area in which **Sony** participated in the computer game market was as a parts supplier to the industry. **Sony** began selling semiconductors to other firms in the late 1980s. In the early 1990s, **Nintendo**, with its Super Famicom machines, became an important chip customer for **Sony**. It was this role as an important parts supplier that brought **Sony** back into direct contact with the home video-game industry.

Others elements which would later become key cornerstones of **Sony**'s home video-game strategy were formed in less direct ways. For example, in the mid-1980s **Sony** was involved in research and development of on-screen digital image processing technology for broadcast booths. This research would later become very successful and develop into an important business enterprise for **Sony**; however, even during its development process there were engineers who expressed their interest in creating products to bring this high quality video picture technology into products designed for home use. There were a number of reasons why such products did not become a reality for **Sony** for some time. While high costs played a role, perhaps an even greater obstacle was the image of home video-game machines held by **Sony**. For many years, **Sony** regarded these machines as mere toys, and therefore not appropriate products for the **Sony** label.

Another factor which would also become important to **Sony**'s home video-game strategy was the CD-ROM disk, which was developed and promoted by **Sony** and Phillips in the mid-1980s. From the earliest stages the low manufacturing cost and high data capacity of the disks attracted a lot of attention. The media was originally created for the storage of music, but soon was also being used to store computer data. CD-ROM drives first entered the home video-game market in 1991 as peripherals for **NEC-HE**'s PC-Engine and **Sega**'s Megadrive. It was clear from this time that the CD-ROM media would likely be a key feature of the next generation of home video-game machines.

As highlighted in the preceding paragraphs, the management and technological resources **Sony** needed for the development and sale of home video-game hardware were accumulated piece by piece inside **Sony**. At the same time, **Sony**'s impression of the home video-game market also gradually began to change, and by the end of the 1980s, the firm was actively considering the possibility of entering this market in a more visible way than as a parts supplier. Branded market entry nearly became a reality when **Sony** began holding talks with **Nintendo** about supplying a CD-ROM drive as a peripheral for the Super Famicom platform. While this particular plan was never actually executed, the talks played a major role in building internal company support for **Sony**'s later decision to enter the home video-game market with

its own hardware platform.

Sony formally began a technology and feasibility study of the home video-game market in 1992, and approximately two years later, in the fall of 1993, **SCEI** was formed. **Sony** rejected the view that the hardware and software segments of the market could be separated. Instead the firm decided that to compete successfully in the market, the new company needed to have strength and experience both in hardware and in software. Thus, **Sony** set up **SCEI** as a joint venture between itself and one of its own subsidiaries, **Sony** Music Entertainment, a firm which has had great success as a content supplier. In addition to each supplying half of the start-up capital, **SCEI**'s employees came from both sides of the joint venture.

Following its establishment, **SCEI** proceeded at a breakneck pace to develop and manufacture hardware and to license software producers to develop for its brand-new hardware platform. In December of 1994, just over one year after its establishment, **SCEI** brought its product, PlayStation, to market.

<Strategy of Each Firm>

The common thread among the firms in this new round of competition in the home video-game market was the attempt by each to achieve the same hardware and software success which **Nintendo** had accomplished over the previous ten years. Naturally, the firms all tried to imitate what **Nintendo** had clearly done right. Where the various firms differed was in what they viewed as the problem areas of **Nintendo**'s strategy and in their attempts to improve on **Nintendo**'s policies.

Generally speaking, the business area which was considered to be most in need of improvement was **Nintendo**'s software distribution strategy. Management at **Sega** and **SCEI** in particular were critical of **Nintendo**'s distribution system. However, **Nintendo**'s distribution problems were not solely due to distribution policies, rather, some of the problems were really symptoms of other problems within **Nintendo**'s overall strategy. The unique characteristics of the home video-game market and its products were also responsible for some of the distribution difficulties. Special characteristics of the home video-game market include: demand uncertainty, frequent short lived sales spurts of hit products, long lead times needed to produce the semiconductor chips used in game cartridges and consequently a need for accurate early product ordering by wholesalers and retailers. Another source of distribution problems was the industry's lack of a manufacturer take-back policy whereby the manufacturer accepts returns of unsold merchandise from retailers and distributors. Since wholesalers and retailers do not want to miss out on the sales of hit products, both tend to order more units than are actually needed of a particular game title. Thus, many warehouses and stores are left with with surplus

inventories. Not being able to return these products creates a burden for retailers and distributors. Further complicating matters is the thick multiple-layer structure of the distribution system. Severe competition for market share among retailers is also a problem. Firms are motivated to sell home video-game products at discounted prices, thus hurting profit lines. As a result, retailers increasingly turn to selling used game software in search of better profit margins.

While many of the distribution problems described above may not have directly affected **Nintendo**'s profits, they have hurt the industry's distributors and retailers. Thus, it can be said that distribution and retailing problems are a major cause of the slowing of overall market growth in the home video-game industry which has occurred in recent years.

As described before, the distribution of **Nintendo**'s products was carried out largely under the auspices of the main association of distributors in the toy industry, Shoshinkai, with which **Nintendo** had a very close working relationship. This closeness was one factor which was responsible for **Nintendo**'s high degree of market control in the home video-game market. **Nintendo**'s competitors, on the other hand, viewed **Nintendo**'s reliance on Shoshinkai as a major reason for many of the distribution and retailing problems listed above. In addition to competing with **Nintendo** in hardware and software, these firms also sought to develop improved distribution channels and by doing so attract users, software firms, wholesalers, and retailers to their new hardware platforms.

The following four sections examine the hardware, software, and distribution strategies employed by the various firms.

1) **SCEI**

The product differentiation of **SCEI**'s PlayStation lay in the markedly higher performance of its grapical capabilities. This distinguishing characteristic fit well with **SCEI**'s basic goal in its product concept development which was to create an interactive machine for home use which possessed top level video processing power. PlayStation succeeded in doing just that as its video processing capacity rivaled that of the arcade machines of the early 1990s. PlayStation's 3D computer graphics drawing capability is superior to that of Sega Saturn, though in many respects the two platforms are quite similar. In this third round of hardware competition, users seem to attach a lot of importance to a platform's 3D graphics power. So in this area PlayStation possesses an edge. However, unlike Sega Saturn, PlayStation's functionality is strictly limited to that of a game playing machine. There is little that can be done to expand the machine to accommodate other uses.

In an effort to compensate for its lack of experience in the computer software market, from the hardware development stage of PlayStation, **SCEI** worked together in a strategic

alliance with **Namco**, one of the top two software firms the video-arcade game market (the other being **Sega**). **SCEI** also sought to improve its own in-house software creation, an area where the firm lagged far behind its rivals. Soon after its incorporation **SCEI** acquired the operations of the software production division of Epic **Sony**, a **Sony** group firm which developed games for the **Nintendo** Super Famicom platform. Nevertheless, even with this acquisition, **Sony**'s in-house capabilities in software creation remained weak compared to its two main competitors, **Nintendo** and **Sega**. Recognizing this fact, **SCEI** added other large scale partnerships to the business alliance it had with software powerhouse **Namco**. **SCEI** also lined up a number of lower profile yet still significant alliances with other software firms, and sought to benefit from the creative dynamism of these partners.

To further promote the development of software for its hardware, **SCEI** enacted a number policies designed to create an environment friendly to software firms. Policies included low licensing fees, relatively loose production consignment regulations, greater freedom in software content, and comparatively low prices charged for machines used in the development of games for PlayStation. Such policies were effective; not only did many already active software firms start supplying games for PlayStation, but also new firms and talent not previously part of the home video-game industry entered the market and began creating software for **SCEI**'s platform.

The next two paragraphs describe **SCEI**'s distribution strategy.

SCEI's decision to use CD-ROMs as PlayStation's software medium created a number of opportunities for the firm to alter the typical distribution pattern of the home video-game market. First, low production costs of CD-ROMs allowed **SCEI** to purchase entire production lots of game titles from software makers. **SCEI** would then distribute the games directly to retailers from its own warehouse facilities. Second, the short production time required to make CD-ROMs and the already established music CD distribution network (Japan Record Distribution [JARED]) of **SCEI**'s parent firm, SME, gave **SCEI** the flexibility to respond quickly to software orders from retailers. As a result, retailers were able to keep inventories down. Thus, **SCEI** could employ a dramatically different distribution strategy than what had previously been seen in the industry and thereby take advantage of the strengths of other **Sony** Group companies. By doing so the firm was able to realize many of the potential benefits offered by the CD-ROM format.

In addition, the effect of **SCEI**'s establishment of a new distribution structure was to lessen the costs borne by the distribution sector of the industry. Instead, **SCEI** itself assumed much of this risk. Thus, **SCEI** successfully created favorable conditions for firms which affiliated themselves with the PlayStation platform. Furthermore, in an effort to pull the market

closer to the optimal situation where only the amount of product actually needed is supplied, **SCEI** strongly discouraged the discounting of new PlayStation software and the selling of used games. That such policies would lead to better profits for software firms was clear, but **SCEI** also reasoned that its own bottom line would be improved by enforcing better market discipline.

2) **Sega**

Since the core technology of Sega Saturn is essentially the same as that which can be found in arcade machines, it is easy to see why the platform's main strength lies in its ability to bring the entertainment value of arcade quality gaming to the home. The high performance of the platform is most apparent in its on-screen video processing power, especially for two dimensional video motion. Sega Saturn is also expandable and has the potential to become a multimedia input/output device for home use within a networked electronic system.

Sega's software strategy revolves around the strengths of the firm's hardware and **Sega**'s top position in the arcade-game market. **Sega** released one big arcade hit after another for the Sega Saturn platform. Two of the more notable early titles were Virtua Fighter and Daytona USA. Despite the success of its own software, **Sega** was careful not to repeat the mistake it had made with its 8-bit machines and 16-bit Megadrive unit. In both instances **Sega**'s own software became too dominant, thus stunting the positive effects a dynamic third-party software market can give hardware diffusion. Aware that this mistake had played a significant role in the disappointing results of its first two platforms, **Sega** sought to involve many different software firms in developing games for its new platform. To this end **Sega** kept its royalties and production consignment fees low.

For the product distribution of its earlier products, **Sega** had used members of the main association of toy distributors (Shoshinkai). **Sega** realized, however, that the introduction of Sega Saturn could serve as an opportunity to alter the status quo to its favor. Toward this end, the firm established its own independent chain of retail stores called, **Sega** United. **Sega** also jointly invested capital with Hitachi to form another chain of stores called, Hitachi Media Force. Additionally, **Sega** entered into a business alliance with Toshiba EMI. Further changes in **Sega**'s product distribution strategy came in the form of capital injections from **Sega** into small- and medium-sized wholesalers. Through these actions, **Sega** was able to strengthen its position vis-à-vis the existing toy retailers. The two business partnerships, one with a major home electronics manufacturer and the other with a large record label, also enabled **Sega** to broaden its sales network.

3) **Matsushita Electronics**

Matsushita's game platform, 3DO-Real, is based on the hardware standard of the American firm, 3DO. This standard was formed under the leadership of the American software firm, Electronic Arts, and was created in an attempt to unify the home video-game hardware market under a single standard. The goal was to reduce the burden on software firms by establishing a standard which was compatible with games created for the various hardware platforms. **Matsushita**'s choice of this standard as the base of its hardware platform coincided with the firm's decision to pursue a hardware differentiation strategy unlike that of any of its competitors. **Matsushita** resolutely positioned its product in the market as a multimedia entertainment machine, rather than simply as a game player. As a consequence of incorporating into the platform a variety of uses outside of traditional game playing, the hardware itself was quite costly to produce. The higher cost was passed on to consumers and the market price for 3DO-Real was well above that of its rivals.

On the software side, the fact that **Matsushita Electronics** is not among the original developers of the 3DO standard means that **Matsushita**'s profits do not benefit directly from software sales. Other hardware firms do directly benefit from software sales because they command licensing and royalty payments when other software firms produce for their standards. This source of revenue is not available to **Matsushita**.

The 3DO standard's overall low royalty and production consignment fees are attractive to software firms, giving a boost to the hardware's ability to attract good software.

Matsushita hoped to make a drastic change in the distribution sector of the home video-game market by selling its platform in its own network of home electronics retail stores. Although the firm initially began selling exclusively from these stores, eventually, to increase sales the firm started selling its hardware at discount stores and toy stores as well.

4) **NEC-HE**

PC-FX was developed by **NEC-HE** as the successor to the firm's PC-Engine platform which had first gone on-sale in the late 1980s. The main selling point of the new platform is its high performance in displaying on-screen movement, typically animation. The new machine was designed to appeal to the market segment comprised primarily of the same computer animation fans who formed the core user group of the PC-Engine platform. (The two systems are not compatible, however.) Another distinguishing feature of the new **NEC-HE** product is that the software for the platform is compatible with the NEC PC-98 series of personal computers, a line which occupies a major share of the Japanese PC market.

NEC-HE distributed its first game machine, PC-Engine, through Shoshinkai, the main association of toy distributors, via a distribution network quite similar to that employed by **Sega**. With the introduction of PC-FX however, the firm shifted its strategy and began to

distribute its new product through the distribution network of its personal computer business.

<How Each Firm Fared, 1995 and beyond>

As described in the previous section, by the end of 1994, each firm (**Sega**, **SCEI**, Matushita, and **NEC-HE**) had released its own new hardware product. These new platforms jockeyed for market share with each other as well as with the market leader, **Nintendo**. This section of the case focuses on the hardware sales policies of these firms, while paying particular attention to **Sega** and **SCEI** and the defensive tactics employees by **Nintendo**.

Both SEC's PlayStation and Sega Saturn went on-sale during the last two months of 1994. PlayStation sold for 40,000 yen ($360) and Sega Saturn sold for the slightly more expensive 45,000 yen ($410). By the middle of the following year however, each had already been discounted by about 10,000 yen ($90). Their prices continued dropping after this, falling another notch in the Christmas season of 1995, before settling at just below 20,000 yen ($180) by March of 1996.

In addition to price cutting, the manufacturers promoted their products with heavy advertising and a number of special marketing campaigns. Heavy investment by a manufacturer in publicity for a platform indicates the strong commitment of the firm to its machine. Such conduct is the most direct way a hardware firm can contribute to creating and fueling a virtuous cycle between hardware and software.

Nintendo countered the market entry of the new hardware platforms by announcing to the market as early as 1993 that it was developing a successor to the Super Famicom machine. The firm leaked information related to this new product using all available channels. The new machine was to outperform the new rival hardware platforms at a price of less than 30,000 yen ($270), perhaps as low as 25,000 yen ($230). **Nintendo** also sought to reiginite the momentum of the vast cumulative market share held by the Super Famicom system. The firm released a graphically intense new game, Super DonkeyKong, and lowered the manufacturing consignment fees it charged to third-party software developers.

Nintendo's counter strategy can be summarized as follows: turn the heavy promotion by both **Sega** and **SCEI** into a market share battle between these two firms for the 32-bit game machine market niche. **Nintendo** strove to keep positive attention focused on its 16-bit platform which could still deliver a satisfying game-playing experience to the average user. At the same time, the firm trumpeted its coming new platform in the hopes that consumers would remain loyal to the **Nintendo** brand and wait for the firm's new hardware without defecting to a rival standard.

6. The Prospects for **Nintendo** and Nintendo64

<**Nintendo**'s Strategy>

What policies did **Nintendo** follow to counter the new round of competition described in the previous section?

Nintendo's strategic conduct can be divided into two phases of actions. The first consists of what the firm did prior to the release of its own new home video-game platform, Nintendo64. As has been described before, this stream of conduct included **Nintendo**'s attempt to leverage the tremendous success of its Super Famicom standard, and the release of information to the market regarding the upcoming new game machine.

The second phase of **Nintendo**'s actions consists of what the firm did to boost the diffusion of its new hardware platform once it was put on-sale. **Nintendo**'s attempt to improve the diffusion of Nintendo64 involved a major overhaul of all areas (hardware, software, and distribution) of its corporate strategy. This reevaluation and strengthening of its market strategy was similar to what went on inside each of the other hardware manufacturers.

The first step taken by **Nintendo** was to form a partnership with the American firm, Silicon Graphics, to create a hardware platform even better optimized for game playing than its previous model had been. Through this alliance **Nintendo** sought to developed a machine that would differ greatly from what its rivals had produced. **Nintendo**'s intention manifested itself primarily in the firm choosing to use a top-of-the-line 64-bit RISC chip as the CPU of its new machine. The new hardware platform also embodied **Nintendo**'s rejection of the industry trend toward CD-ROMs as the medium of choice for software storage and access. Instead, **Nintendo** retained its use of encased ROM silicon chips for delivering software to its new machine, thinking that the silicon chip format has a strong advantage in its quicker read-time compared to CD-ROM. In addtion, **Nintendo** planned to supplement this chip-based software delivery medium with a dedicated magnetic disk drive system scheduled to be released in 1997. **Nintendo**'s new machine also featured a redesigned game controller, which is the part of a game machine which plays the single largest role in determining the ease of use of a platform.

One way **Nintendo** sought to differentiate its hardware from its competitors was through the sale of innovative new accessory devices, such as a proposed vibration pack to be attached to the game controller to allow on-screen action to be actually felt by the user. **Nintendo**'s release of its new product was as much as a year and a half later than its rivals, however many of the new innovative features of the machine had raised manufacturing costs. Nevertheless, Nintendo64 was put on-sale at the competitive price of 25,000 yen ($230). This price was especially attractive given the superior performance of **Nintendo**'s new machine over its competitors. Nintendo64's performance edge was especially apparent in the elevated detail and smoothness of its three dimensional computer graphics.

Nintendo's software strategy for the new game platform is summarized in the following statement by firm president, Mr. Yamauchi, "If trash (poor quality software) increases the only result will be the destruction of the market. **Nintendo** will work hand-in-hand with the best and brightest 'second-party' firms (software developers) to protect the (home video-game) market."[6] From an early stage in the development of Nintendo64, **Nintendo** began narrowing down its likely software partners. While a strategy of very close cooperation with software firms had been attempted before, **Nintendo** hoped to use this generational change in hardware to more fully implement such a plan.

Nintendo's software strategy contrasts starkly with that of **SCEI**. **Sony Computer Entertainment**'s basic software policy is summarized in the following statement by **SCEI** Promotional Planning Division Vice-president, Mr. Saeki, "It's a good thing to have a good (broad) selection (of software available)."[7] Mr. Saeki has also been quoted as saying, "Looking at the history of the music industry it is clear that the most creative artists come from small and medium size record labels. One should be able to say the same thing for game software." Mr. Saeki's comment makes it easy to understand why **Sony** actively provides generous support to small and medium sized software firms to assist them in the discovery of new software design talent. All of these actions by **SCEI** are intended to boost variety in the software market. **Sega**'s software policy can be considered similar to that employed by **SCEI**.

Further evidence of the different attitudes of the various hardware manufacturers towards software for their platforms can be found in the rearrangement of the alliances between hardware makers and software firms. Defections and the subsequent new allegiances of the bigger software firms attracted a lot of attention in the early part of 1996.

Contracts between software firms and hardware manufacturers usually do not include exclusivity clauses by which the software firm promises to create software only for a single hardware platform. As a result, software firms have a degree of flexibility with regard to their relationships with hardware firms. The fact that a software firm has the right to develop the same software title to run on multiple hardware standards is quite significant to the competitive environment of the industry. Software firms can exercise their right to produce for multiple platforms at any time. Such conduct is often employed as a counter-measure when a software firm feels it is being subjected to excessive market pressure by a hardware manufacturer.

Despite the availability of this right to produce for multiple platforms, there exist a number of large software firms which decline to market their games for more than one

---

[6] From an interview in Toyo Keizai Weekly (Eastern [Asian] Economics), December 31, 1994 and January 7, 1995 joint issue.

[7] From an interview in Nihon Kougyou Shinbun (Japan Industrial Newspaper) December 1, 1994.

hardware platform. Important reasons for choosing an exclusive supply policy include the heavy development costs incurred when producing for multiple standards and the lack of any scale merits for such production.

The post-1994 home video-game market, with its rapid increase in economically viable hardware standards, has seen an increase in the market power of software firms vis-à-vis hardware manufacturers.

Since software firms base their decision to produce for a certain hardware platform on the market environment and software development conditions created by the hardware manufacturers, it is not uncommon for software firms to change the platforms based on relative changes among the conditions offered by hardware manufacturers. Naturally, when a firm produces games which run on only a single hardware standard, a decision to change the platforms on which the game runs is especially significant. The contrasting software strategies employed by the various hardware manufacturers in the third round of market competition led a number of firms to move away from **Nintendo** and toward **SCEI** and **Sega** as their flagship development standards. Among such firms could be found the likes of **Namco** and **Square**, firms which had played a major role in Famicom's original dominance of the home video-game market. (See Chart 3 for the number of software firm contracted to the various hardware platforms.)

Partially due to the defections of major software firms from the **Nintendo** standard, six months after Nintendo64 hit the market the number of available game titles hovered at no more than ten to twenty. **Nintendo**'s own products, such as "Super Mario 64" and "MarioKart," formed the core of the platform's software. **Nintendo** was forced to take a patient attitude with its collaborating software firms as it waited for them to develop exceptional games for the new platform.

In distribution, **Nintendo** continued with its traditional reliance on members of the association of game wholesalers (Shoshinkai). Nevertheless, **Nintendo** used the opportunity presented by the rationalization and reorganization which had already been occurring in the distribution industry to institute an allocation system between it and the distributors of software for its machines. Under this allocation policy **Nintendo** "allocates a fixed quantity of product to distributors according to their capabilities."[8] **Nintendo** pursued these and other reforms as it reworked its product distribution strategy. **Nintendo**'s ultimate goal was to turn over most, if not all, distribution functions such as the flow of goods, sales, and product evaluation to those firms which possess sufficient corporate capabilities to perform them effectively. **Nintendo** hoped that these new policies would lead to the establishment of a distribution system closer to

[8] Nikkei Business, January 27, 1997.

the ideal where the appropriate amounts of goods are efficiently supplied to wherever they need to go. **Nintendo** hoped its efforts would help alleviate the many problems which had long plagued the distribution sector of the home video-game industry.

It was in June of 1996, following many years of preparation, that Nintendo64 went on-sale.

<**Nintendo**'s Market Results and Imminent Challenges>

Following the market entrance of the new hardware platforms in 1994, prices charged for Super Famicom hardware and software began to fall. Despite these price cuts however, Super Famicom sales also fell, causing difficulties for **Nintendo**'s bottom line. It wasn't until the brisk initial sales of the long awaited Nintendo64, that **Nintendo**'s business prospects improved. Good sales for the new platform continued and by the end of 1996, half a year after the 64-bit platform first went on-sale, approximately 2 millions units had been shipped. Nevertheless, many began to doubt that **Nintendo** could again achieve with its new hardware the same phenomenal success seen by Famicom and Super Famicom.

There are a number of reasons why industry observers have doubts about **Nintendo**'s ability to produce excellent market results for its new platform. The reasons for the doubts include: the presence of such powerful competitors in the likes of **SCEI** and **Sega**, a lack of available software titles, and a perception in the market that prices for both Nintendo64 hardware and software are excessively high relative to the product's performance. Compounding the market's somewhat negative evaluation of the future prospects for Nintendo64 was the ongoing success experienced by PlayStation despite the increased competition of Nintendo64.

The defections to rival platforms of a number of major software firms increased the uneasiness of the market regarding Nintendo64's future. These desertions included major software companies **Square** (creator of Final Fantasy) and **Enix** (creator of Dragon Quest). It was the software of these two firms in particular which positively impacted the the diffusion of **Nintendo**'s hardware.

Square wrote the following concerning the announcement of its decision to shift away from the **Nintendo** standard. "There are many game platforms, including personal computers which use CD-ROM drives as their software delivery medium. From among these platforms there are only some which allow **Square** to make the kinds of products it seeks to create... of these **Square** has decided that 'the platform which offers **Square** the necessary

game development environment' is PlayStation."[9] This statement by **Square** indicates the importance software firms place on the game technology development environment and business conditions provided for them by the various hardware manufacturers. The statement is also representative of the conclusion drawn by many software firms that the edge at present goes to **SCEI**'s PlayStation and not to traditional market leader **Nintendo**.

It is difficult to overstate the market impact caused by **Square** when it began selling the new version of Final Fantasy to run on the PlayStation platform in January of 1997. **Square**'s switch represented the de facto declaration by the software market that the industry's leading hardware company had changed from **Nintendo** to **SCEI**. Furthermore, the move emphasized the reality that Nintendo64's future rested largely on **Nintendo**'s ability to carry the platform forward by its own unaided efforts.

On top of the software market difficulties facing **Nintendo** as described above, the firm must also decide how to cope with the recent developments in the distribution sector of the industry. **Nintendo** must devise counter-policies to the new distribution methods developed by its rivals, in particular those of **SCEI**. Beyond the challenges posed by the distribution innovations of rival hardware manufacturers, **Nintendo** is also faced with a potentially even more damaging market trend in that some software firms have begun to distribute games on their own, apart from the control of the hardware manufacturer on which the software runs.

Distribution by software firms first occurred in April of 1994 when major game developer **Konami** began independently distributing its software. In November of the same year, a partnership of six firms, including **Square**, established a distribution network centered in convenience stores under the name, **DigiCube**. Such independent conduct on the part of software firms was seldom seen in the days when **Nintendo** dominated the hardware market with its enormous market share lead. It is clear that both the fierce competition among hardware manufacturers, and the growing importance of software firm decisions as to which platforms to develop for, have weakened the market power of hardware firms vis-à-vis software firms. In fact, the relationship among firms in the home video-game market now more closely resembles that of other industrial markets.

One of **Nintendo**'s responses to the various changes in the distribution sector came in the form of the firm's development of a new method of software supply. Beginning in the middle of 1997, software for **Nintendo**'s Super Famicom platform was put on-sale at **Lawson** Convenience stores by means of the quick downloading of games onto re-writeable flash memory cards. This move by **Nintendo** was executed with the dual aim of strengthening the firm's position in the traditional Shoshinkai distribution network and increasing the variety of

---

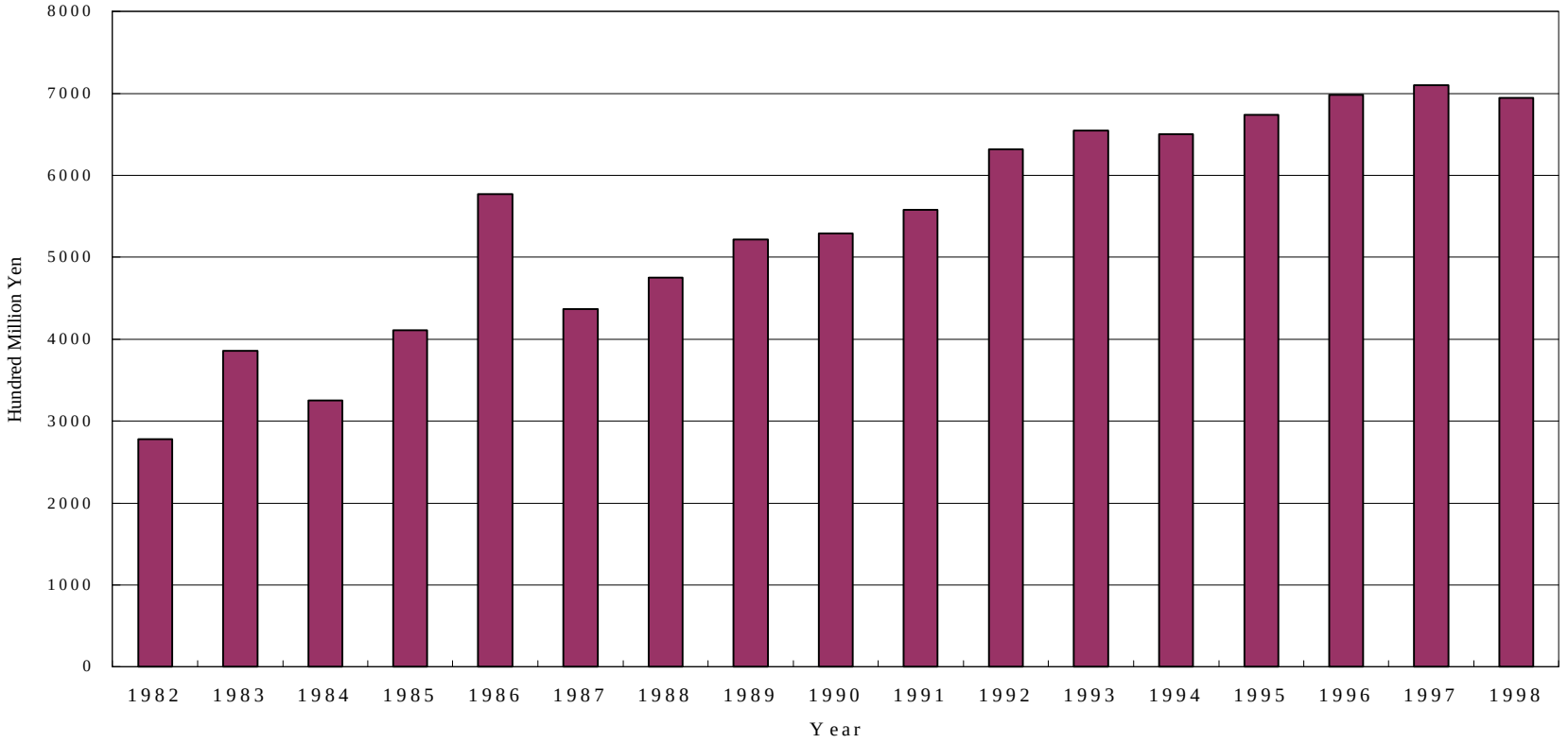
[9] Taken off **Square**'s homepage.

ways in which software for the firm's platforms is able reach consumers.

As outlined above, the current state of the home video-game market is far different from what it was in the days when **Nintendo** could easily maintain the dominant position it has held in the market since its inception. **Nintendo** clearly needs to redouble its efforts to find new initiatives which will reestablish its position as the leading firm in the industry. The strong competition from **SCEI** and other rivals in all areas of **Nintendo**'s business greatly complicates the challenges facing the firm. **Nintendo** must also consider how to contribute to the reinvigoration of the software industry. How to cope with competition from the personal computer industry? What to do about trends towards increasing multimedia functions for home video-game machines? Finally, **Nintendo** needs to consider the fact that the firm may be best served by somehow using the current market trends for its own benefit rather than simply opposing them.

<Supplemental Materials>

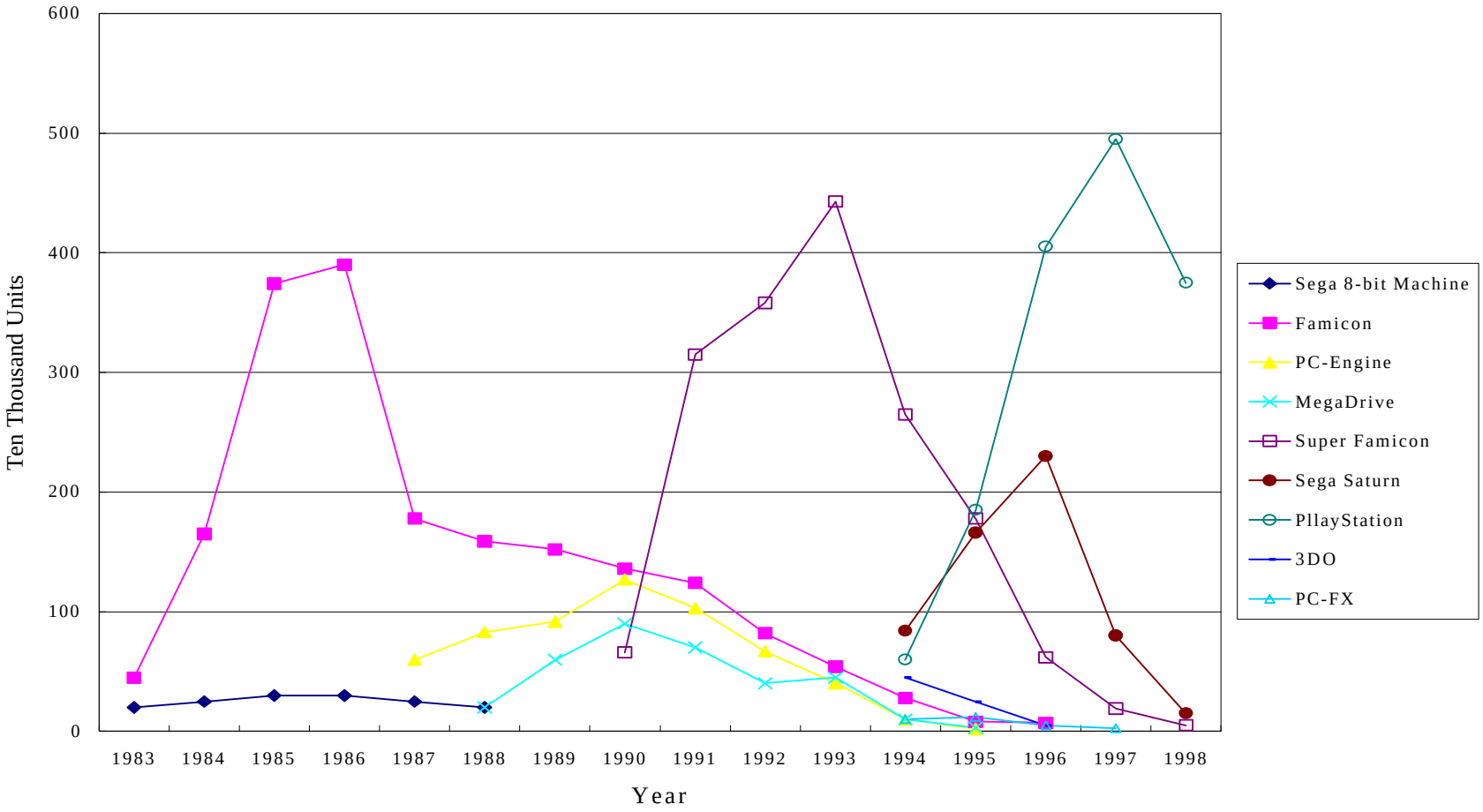
<Figure 1> Home Video-Game Market Size (Domestic, Hardware and Software Combined Total)



*Totals for 1993 and beyond are for fiscal years (This holds for all figures and tables hereafter as well.)

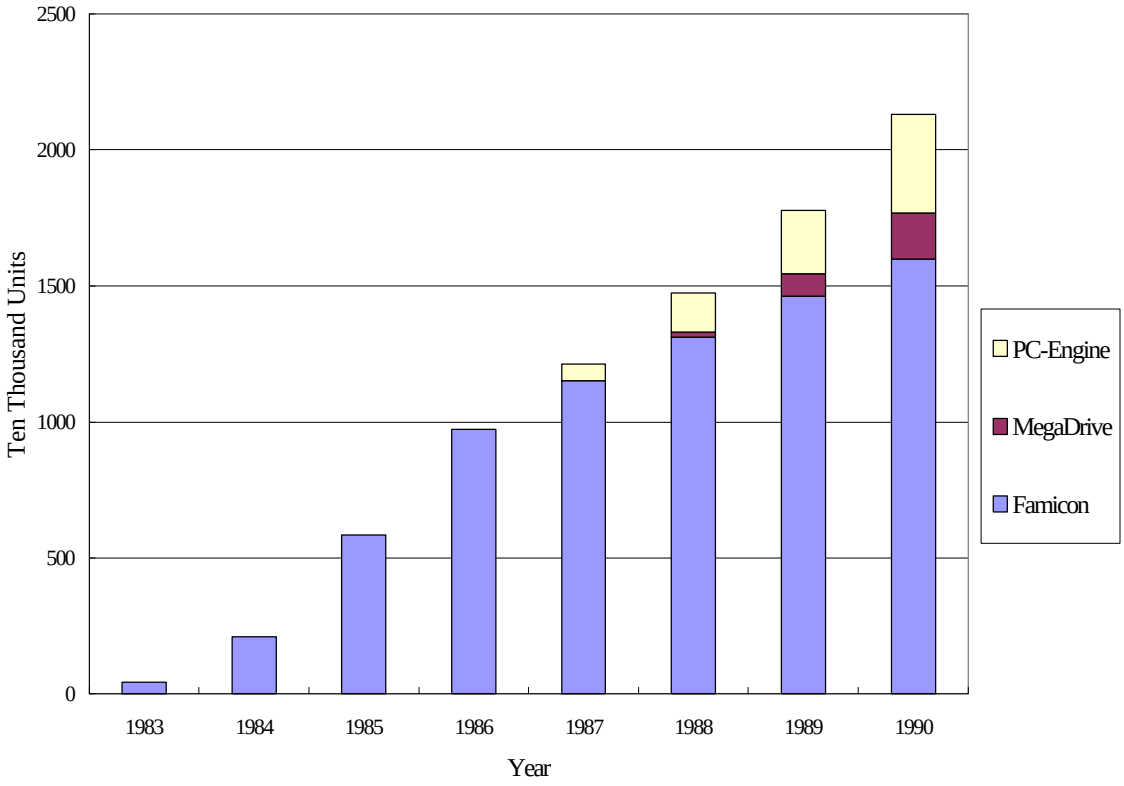
(Source: Data Taken from Reja hakusyo[White paper on Leisure])

<Figure 2> Domestic Hardware Shipments



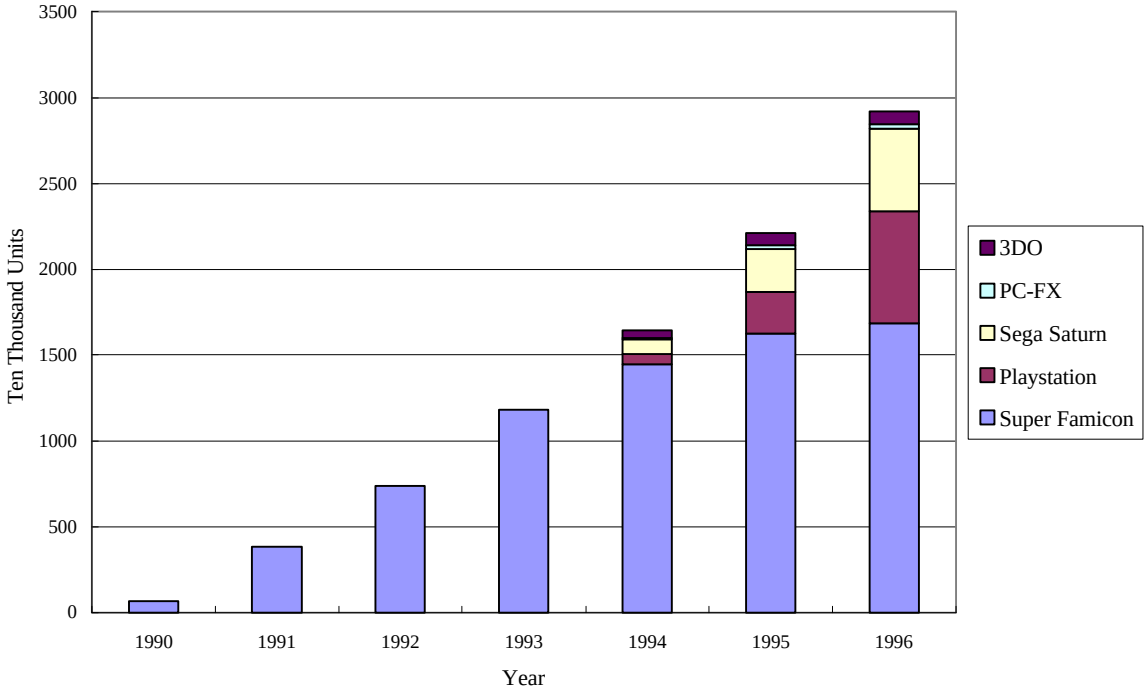
(Source: Data Taken from Jyouhou Medeia Hakusho [Information Media White Paper] '95, Toi Janaru [Toy Journal] , Nihon Maketeingu Shea Jiten [Japan's Marketing Share Dictionary] '93)

<Figure 3> Accumulated Hardware Shipments (1983 to 1990)



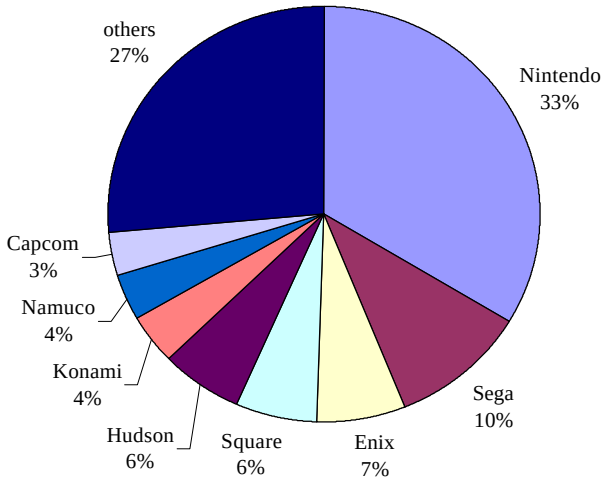
(Source: Same as Figure 2)

<Figure 4> Accumulated Hardware Shipments (1990 to 1996)



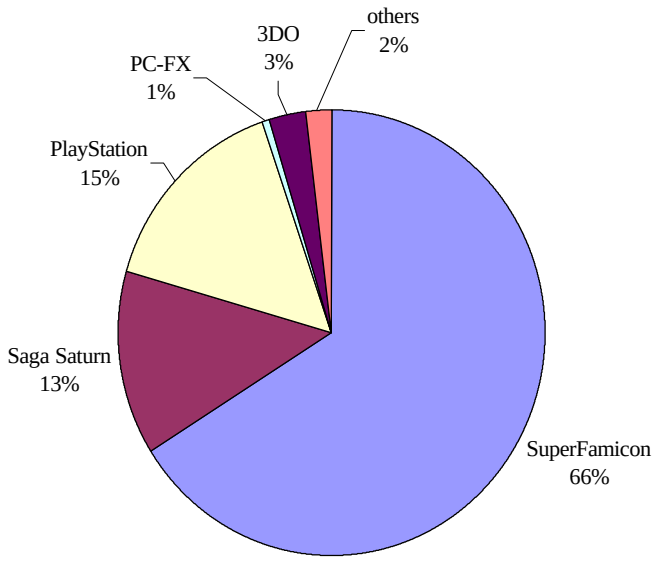
(Source: Same as Figure 2)

<Figure 5> Software Market Shares (1995, ranked by total yen sales)



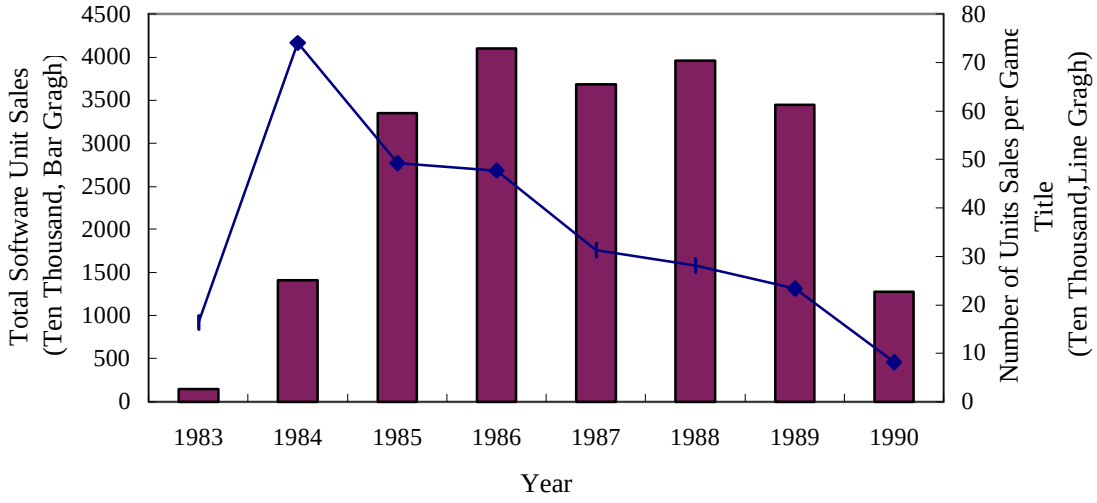
(Source: Nikkei Shea Jiten [Nikkei Share Dictionary] '96)

<Figure 6> Software Market Shares by Platform (1995, ranked by total yen sales)



(Source: Data Taken from Toi Janaru [Toy Journal] '96)

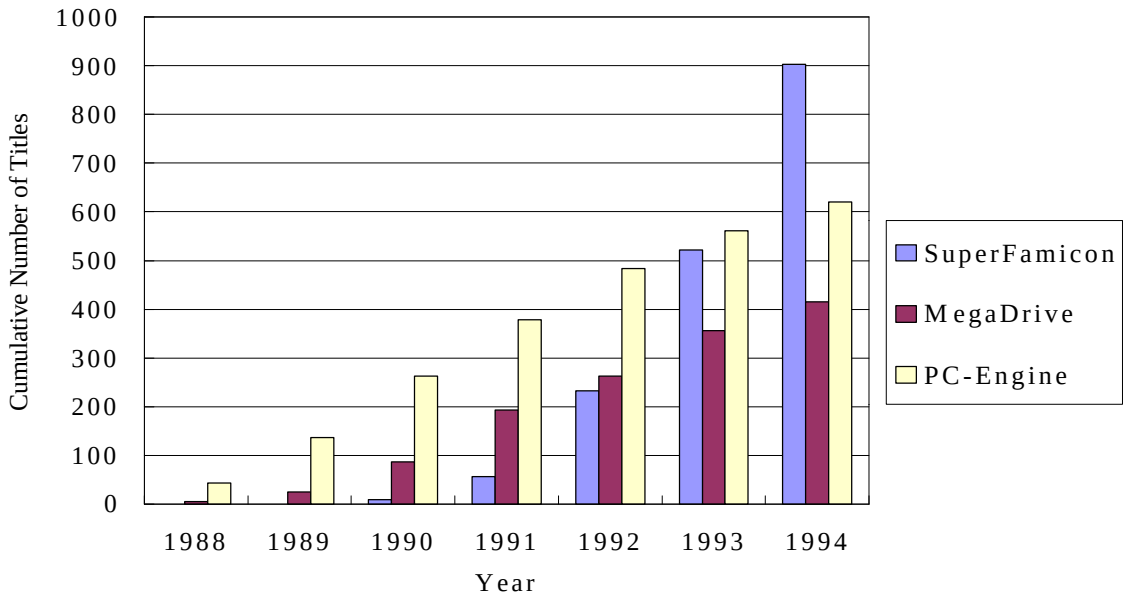
<Figure 7> Market Changes for Famicom Compatible Software



Cumulative Number of Third-party Software Firms	1	3	19	37	52	n.a.	n.a.	n.a.
Number of Software Titles Released	9	19	68	86	118	141	147	157

(Source: Taken from Kohashi, 1993 and Hirabayashi and Akao, 1996)

<Figure 8> Software Market in Period 2



(Source: Data Taken from Kohashi,1993 , Jyouhou Medeia Hakusho [Information Media White Paper] '95, Toi Janaru [Toy Journal] , Nihon Maketeingu Shea Jiten [Japan's Marketing Share Dictionary] '93)

<Chart 1> Major Hardware Business Alliances, from 1994

Hardware Manufacturer	Hardware/Chip Related	Software Related	Other
Matsushita Electronics	3DO (USA) ...Hardware License Capital Investment video-arcade Machines ARM (England) ...Joint Development of CPU		Japan Victor ...CD-ROM Production
Sega	Hitachi ...CPU, Joint Development of Compatible Machine Yamaha ...Joint Development of Audio LSI	SNK ...Cross License of Software	Hitachi Media Force Toshiba-EMI ...Sales Alliance Time Warner ... Alliance in On-line Software Sales
SCEI	Namco ...Joint Development of Hardware and Arcade Game Use Boards LSI Logic (USA) ...Joint CPU Development		SME ...Capital Injection, CD-ROM Production Sony ...Capital Injection
NEC-HE	NEC ...Joint Development of CPU Hudson ...Joint Development of Video Processing Chip		
Nintendo	Silicon Graphics (USA) ...Joint Development of Hardware NEC ...Supply of CPU		St. Giga ...Capital Investment

(Source: Taken from Hirabayashi and Akao, 1996)

<Chart 2> Hardware Specs (for platforms put on-sale during or after 1994)

Hardware Name	Price	Date Put On-Sale	Cumulative Unit Shipments	Software Delivery Medium	Main Software Titles
3DO-Real		March 20, 1994	700,000	CD-ROM	
Sega Saturn	Approximately 20,000 yen	November 22, 1994	4.4 million	CD-ROM	Virtua Fighter (Sega), Virtua Cop (Sega), Daytona USA(Sega)
PlayStation	Approximately 20,000 yen	December 3, 1994	5 million	CD-ROM	Tekken (Namco), Ridge Racer (Namco), Bio Hazard (Capcom)
PC-FX	Between 25,000 and 35,000 yen	December 23, 1994	220,000	CD-ROM	
Nintendo64	Approximately 25,000 yen	June 23, 1996	2 million	Silicon Chip Cartridge, Magnetic Disk (Planned)	Super Mario 64 (Nintendo)

*Cumulative figures are for through the end of 1996

(Source: Taken from newspaper announcements and other material)

<Table 3> Number of Third-Party Software Firms, by Platform

	Super Famicom	3DO	Sega Saturn	PlayStation	PC-FX
Software Firms Under Contract	175	870	350	500	48
Cumulative Software Titles	1287	207	234 (400)	246 (501)	20

*Data is as of March 31, 1996, except estimated figures inside of parentheses for Sega Saturn and PlayStation which are for as of September, 1996

(Source: Taken from Toi Janaru [Toy Journal] '96 and HaSegawa, 1997)

<Table 4> Firm Size for the Three Major Hardware Manufacturers

	Nintendo		Sega		SCEI	
	Sales	Profit	Sales	Profit	Sales	Profit
1987	1402（1292）	485（446）				
1988	1786（1691）	500（422）				
1989	2502（2243）	614（552）				
1990	2100（1638）	552（553）	786（397）	110（106）		
1991	4510（3183）	1404（1378）	1065（587）	166（156）		
1992	5075（3744）	1562（1404）	2133（1355）	335（352）		
1993	5628（4430）	1638（1505）	3469（2305）	550（561）		
1994	4671（3780）	1151（1207）	3540（2402）	425（413）		
1995	3507（2773）	978（1172）	3333（1977）	232（279）		
1996	3005（2392）	1171（701）	3461（1790）	317（285）	1913	35

(Unit: hundred million yen)

*Yearly figures are for fiscal years ending in March, except for Nintendo 1987-1989 which are for one year periods beginning in September. The figure for 1990 is for the six month period from September, 1989 to March 1990.

*Figures in parentheses represent amounts for businesses related to home video-games.
[Figures for Nintendo are totals for Famicom, Super Famicom, platform peripherals, software license receipts, and rental receipts.
Figures for Sega are totals for sales of machines to consumers and royalty receipts.]

*For profits, figures outside of parentheses are income before extrodinary items and cumulative effects of accounting changes, and figures inside parenthesis are for operting income.

(Source: Taken from each firm's stock holder reports, Nihon Keizai Shinbun [Japanese Economic Newspaper] "Kaisha Souran [Company Summaries]", and answers to interviews.]

<Bibliography>

Aida, Hiroshi and Atsushi Ogawa (1997), Bideo Kyohu no Koubou - Shindenshi Rikkoku 4 [The offensive and defensive struggle over video wealth - the establishment of the new electronic world 4], NHK publishers.

Asakura, Reiji (1998), Sony no Kakumei Kentachi [Sony's revolutionary vision], IDG Communication.

Dentsu Souken [Dentsu Research] (1995), Jyouhou Medeia Shirohaku [White paper on information media].

Hasegawa, Masashi (1997), Kateiyou Terebi Gamu - Nintendo64 wa Ureru no ka? [Television games for home use - Will Nintendo64 sell?], Gakushuin Daigaku Shintaku Zemi Sotsugyou Ronbun [Graduation paper for Shintaku seminar, Gakushuin University].

Hirabayashi, Hisakazu and Kouichi Akao (1996), Gemu no Daigaku, Medeia Fakutori [Media Factory].

Ichikawa, Koushi (1993), Konpyuta Gemu [Computer Game], Nihon Keizai Shinbun Sha [The economic newspaper of Japan company].

Kohashi, Reika, "Kateiyou Terebi Gemu Sofuto Sangyou no Senryaku to Soshiki" [Strategy and Structure of Video Game Software Industry], Bijinesu Insaito [Business Insight], Autumn 1993.

Kohashi Rreika,"Kansetsu Seigyogata nettowaku to Fukakujitsusei -Kateiyou Terebi Gemu Sangyou ni okeru Kigyoukan Sisutemu"[The Rule-Regulated Network and Uncertainity],Rokkoudai Ronsyu vol.41 No.2 ,1993.

Nakama, Masahiko, Yosura Fujimoto, Yoshiyuki Etou, and Fumihiko Ikuine, Kateiyou Gemuki Sangyou ni kansuru Kouryou [A consideration of the home video-game hardware industry], Seminar of Professor Fujimoto, The University of Tokyo, 1996.

Nihon Sangyou Shinbun [The industrial newspaper of Japan], "Market Share Rates", Nihon Keizai Shinbun Sha [The economic newspaper of Japan company], Yearly issues.

Nikkei Bishinesu [Nikkei Business], Nikkei BP Sha [Nikkei BP company], January 27, 1997.

Oshita, Eiji (1993), Sega - Gamu no Okoku [Sega - the kingdom of games], Kodansha, 1993.

Takayanagi,Takashi (1996), Gemu Sensen Cho-Ijyou - Nintendo vs. Sony [The game front, extremely irregular - Nintendo vs. Sony], Sofuto Sha.

Toukyou Gamgu Ningyou Donya Kyoudou Kumiai [The Tokyo toy and doll wholesalers union], Gekan Toi Jyanaru [Monthly Toy Journal], July, 1996.

Touyou Keizai Shinpou Sha [The eastern economic news service company], Shukan Touyou Keizai [Weekly eastern economics], December 31, 1994 and January 7, 1995.

Wejji [Wedge], Wejji [Wedge], January 1996.

Yada, Mari (1996), Gemu rikkoku no miraizou [The future of the game world], Nikkei BP.

Yamana, Ichiro (1994), Kingu obu Gemu no Miraisen [The future war to be the king of games], Nihon Jigyou Shuppan Sha.

Zaidan Houjin Yoka Kaihatsu Senta [Research Institute Leisure Development Center],*Reja Hakusyo*[White paper on Leisure].

Sega Enterprises Incorporated, Report to Shareholders

Nintendo Incorporated, Report to Shareholders

Nihon Keizai Shinbun [The Japanese economic newspaper]

Nihon Kougyou Shinbun [The industrial (manufacturing) newspaper]

Homepages of the various companies