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A HISTORICAL STUDY OF TYPEWRITER MANUFACTURERS

An Interactive Qualifying Project Report

submitted to the Faculty

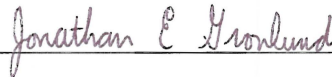
of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

by




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Date: December 15, 2005



Professor Erwin Danneels, Project Advisor

1. electronic typewriters
2. personal word processors

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Abstract

The introduction, growth, and decline of the electronic typewriter and personal word processor industries are presented and analyzed. The report illustrates how intense competition and the growth of the computer industry were the main reasons for the demise of both industries. In addition to an examination of both industries, individual profiles of electronic typewriter and personal word processor manufacturers are studied. Finally, the report applies two theories of market evolution to further explain the demise of both typewriter industries.

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1. Introduction

While the typewriter industry was formed in the late nineteenth century, the industry did not endure significant changes until the late 1970s. Prior to 1970, all typewriters were large mechanical or electromechanical devices that only satisfied a user's need to type letters or other small documents. The major difference between these two types of typewriters was the process used to generate letters on the paper. Mechanical typewriters possessed a direct mechanical connection between the keys and the device that struck the paper. In other words, each key on the keyboard was directly attached to a typebar which contained the appropriate letter molded on the other side.¹ To make letter generation easier, electromechanical typewriters used motors. A key pressed on an electromechanical typewriter "engaged mechanical linkages that directed mechanical power from the motor to the typebar."¹

In addition to their large size and limited functionality, both mechanical typewriters and electromechanical typewriters were very expensive. In fact, the earliest electromechanical models contained more than 2,000 parts that were constantly in motion as the typewriter was being used.² Thus, parts needed to be constantly replaced and the significant labor costs associated with fixing the parts meant that only large businesses could afford them. Even though typewriter designs became more efficient over time, the typewriters were still limited in the sense that they could only be used to construct simple documents. However, the introduction of the electronic typewriter in the late 1970s revolutionized the industry.

¹ *Typewriter (Wikipedia, The Free Encyclopedia)*, 2005, <http://en.wikipedia.org/wiki/Typewriter> (5 December 2005).

² Ellen Roseman, "It's Taps for the Old-Fashioned Typewriter," *The Globe and Mail*, 25 August 1983.

Electronic typewriters redefined the industry because they were the first category of typewriters to use microprocessors. Basically, a microprocessor is a “complete computation engine fabricated on a single chip.”³ Microprocessors permitted typewriters to perform advanced functions such as character storage and text formatting that could not be handled on electromechanical typewriters. Further, as electronic typewriters became more sophisticated, they were designed with small screens that could display one or two lines of text. These screens allowed users to view and change text before it was printed. Finally, microprocessors were able to greatly reduce the number of moving parts, which made them affordable for individual consumers in addition to businesses. While the electronic typewriter effectively introduced households to typewriters, many household users wanted to perform more functions than the electronic typewriter could provide. As a result, personal word processors were developed to satisfy their needs.

The introduction of the personal word processor in the mid 1980s effectively satisfied consumers that wanted to perform more sophisticated functions. Perhaps the most important feature of personal word processors was a full CRT or LCD screen. A full screen enabled users to fix every mistake before the document was printed as well as format the entire document to meet their specifications. Furthermore, personal word processors could also be connected to other office products, such as fax machines and printers. In the end, the personal word processor was a very powerful and innovative device since it was one of the first technological products that performed sophisticated tasks with a user-friendly setup and design. Table 1 summarizes the different types of typewriters.

³ Marshall Brain, *How Microprocessors Work*, 1998, <http://computer.howstuffworks.com/microprocessor1.htm> (2 November 2005).

Table 1: Different Typewriter Product Categories

Product Category	Functionality⁴	Technological Base	Year Introduced⁵
Mechanical Typewriter	Documents could be written by pressing keys that were directly attached to a typebar with molded letters. The typebar then hit an ink ribbon which generated the appropriate character on the paper.	movable mechanical parts and ink ribbons	1867
Electromechanical Typewriter	Documents could be written by pressing keys which generated mechanical power from a motor to a typebar. The typebar then hit an ink ribbon which generated the appropriate character on the paper.	movable mechanical parts, a motor, and ink ribbons	1961
Electronic Typewriter	limited word processing, text formatting, spell check, and limited storage	microprocessor, 2-segment display, memory, and carbon ribbons	1978
Personal Word Processor	word processing, text editing, spell check, text formatting, small applications, and decent storage	microprocessor, RAM, and CRT display	1981
Personal Computer	software provides numerous functions, large storage, and advanced formatting	microprocessor, RAM hard drive, CRT/LCD, and motherboard	1982

⁴ *Typewriter* (Wikipedia, *The Free Encyclopedia*), 2005, <http://en.wikipedia.org/wiki/Typewriter> (5 December 2005).

⁵ The years are approximations since it is difficult to tell precisely when each product was officially introduced.

This study examines the growth, development, and decline of the typewriter industry. Both electronic typewriters and personal word processors are discussed and analyzed. For classification purposes, typewriters with fewer than two lines of text display are considered electronic typewriters. Further, price is used to distinguish between office electronic typewriters and consumer electronic typewriters. Consumer electronic typewriters were priced less than \$500 while office electronic typewriters were priced higher than \$500.⁶ Any typewriter with a screen that displays more than two lines is classified as a personal word processor. The study begins in the late 1970s since the introduction of the electronic typewriter was largely responsible for the growth of the industry. The research concludes in the mid 1990s because electronic typewriter shipments showed no signs of reviving after a few years of steady decline.

⁶ *Electronic Typewriter Planning Service* (Venture Development Corporation Report, 1989), I-7 – I-8.

2. Research Methodology

The majority of the data used in this study was based on reports published by Venture Development Corporation (VDC), a market research firm. However, data from other sources such as International Data Corporation, the U.S. Department of Commerce, and the Information Technology Industry Data Book were also examined. These three sources were not used because they did not contain the level of detail that the VDC reports provided. For example, in the U.S. Industrial Outlook reports published by the U.S. Department of Commerce, typewriter statistics were not directly provided. Instead, information about typewriters was grouped into a more general office equipment category. This made it very difficult to isolate data about typewriters. In the Information Technology Industry Data Book and International Data Corporation reports, very little attention was given to consumer electronic typewriters. In the end, the VDC reports contained the most specific and distinct data about office and consumer electronic typewriters as well as personal word processors. Using one source for the majority of the data improved the overall consistency of the calculations and graphs.

Since research firms usually wait until an industry grows and develops before they direct resources toward analyzing the industry, market share information for the earliest years of this report (1978 – 1987) is not included. The electronic typewriter industry simply did not become an established market in the eyes of research firms until the mid 1980s. As a result, market share data for this report begins in 1988. Also, reliable data for 1989 could not be found and the data that is presented for this year is based on estimates obtained from VDC as well as other sources. Table 2 provides a summary of the data that is provided in the report. As a final note, all graphs that display

the total dollar value of a given typewriter market are computed based on the factory pricing level. The factory pricing level is the first level of distribution which represents the actual dollars that go directly to the typewriter manufacturer.

While the VDC reports provided most of the data used for the graphs, the written report was based largely on articles from Factiva, an online database. Two separate searches of Factiva were performed to locate the articles. The first search, which took place on August 31, 2005, used “electronic typewriter” as the search terms. The search results were ordered by date, and all articles written after 1998 were not considered since those years exceeded the scope of the report. On September 7, 2005, the second search was conducted using the keywords “personal word processor.” Again, results were ordered by date, and all articles written after 1998 were not used.

Table 2: Data Provided in Report

Data Value	Years Covered in Report
Total ET Shipments Total Value of the ET Market Total ET Shipments by Category Total Value of the ET Market by Category Average Price of ETs by Year	1978 – 1994
ET Market Shares Based on Market Value Office ET Market Shares Based on Market Value Consumer ET Market Shares Based on Market Value PWP Market Shares Based on Market Value PWP Market Shares Based on Total Shipments Average PWP Prices by Year PWP Shipments by Type Total Value of the PWP Market by Type	1988 – 1994

3. History of Electronic Typewriters

3.1 Introduction and Growth of the Electronic Typewriter Industry

The first entry into the electronic typewriter market was made by the Qyx division of Exxon Office Systems in 1978. Qyx's Intelligent Typewriter Level 1 sold for \$1,600, had one kilobyte of memory and was designed for high-end business users.⁷ Almost immediately after the introduction of the Intelligent Typewriter Level 1, IBM followed with two electronic typewriter (ET) models also designed for business customers.⁸ IBM's quick reaction to Qyx's new product innovation foreshadowed the intense competition that would come to define the ET industry. However, despite being the first company to enter the market, Qyx was quickly overshadowed by IBM. In fact, toward the end of 1978 it was estimated that IBM owned more than 90% of the \$60 million market.⁹

Initially, IBM dominated the ET market due to a strong brand name and positive customer relationships. Through their involvement in electromechanical typewriters and other business machines, IBM's brand became associated with quality and reliability.¹⁰ Therefore, it was relatively easy for the company to convince its existing customers to purchase an IBM ET to satisfy their growing typing needs. IBM's early market success prompted both Olivetti and Olympia to enter the ET market in 1979. Then, in 1980, the market grew to seven competitors as Syntrex, Contitronix, and SCM all entered the market. While it appeared that the market would continue to grow steadily over the next

⁷ Boggs et al, *U.S. Electronic Typewriter Markets: A Strategic Analysis 1982 – 1987* (Venture Development Corporation Report, 1982), 22.

⁸ "IBM Introduces Two New Electronic Typewriters Using Microprocessors to Carry Out Certain Functions," *New York Times Abstracts*, 25 May 1978.

⁹ "Article on Electronic Typewriter Industry; Says IBM's Market Share is Tumbling," *New York Times Abstracts*, 23 November 1984.

¹⁰ "Typewriters of Electronic Era," *The New York Times*, 23 November 1984.

few years, the ET industry encountered an enormous growth spurt as the number of competitors doubled from seven to fourteen in 1981. Table 3 lists the firms in the ET industry along with their year of entry.

The frenetic entry into the ET market by numerous companies can be linked to the high growth rates realized by the ET market. As mentioned above, the ET industry was worth approximately \$60 million in 1978. By 1980, the industry was worth more than \$180 million. This meant that, over a three year period, the ET industry saw an annual growth rate of more than 70%.¹¹ As a result, the new competitors seized the opportunity to create more advanced ETs with the hope that large profits would follow.

As the number of competitors in the ET market increased, IBM's market share declined dramatically. IBM held approximately 90% of the market in 1978 and their share was down to 25% by 1982.¹² The main reason why IBM lost ground was because they were not producing satisfactory products. IBM's ETs lacked many features that were present in ETs made by the competition. In addition to having fewer features, IBM's ETs were usually the highest priced in the market. However, it should be noted that even though IBM's share of the market was reduced, the company still increased its revenue every year from 1978 to 1982.¹³ IBM's ability to increase sales with an inferior product demonstrated the high demand customers had for ETs in the early 1980s.

¹¹ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 20.

¹² "Article on Electronic Typewriter Industry; Says IBM's Market Share is Tumbling," *New York Times Abstracts*, 23 November 1984.

¹³ Franklin Whitehouse, "IBM's Typewriters Miss a Stroke," *The New York Times*, 28 March 1982.

Table 3: Earliest Entrants in the ET Market¹⁴

<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Qyx IBM	Olivetti Olympia	Syntrex Contitronix SCM	Brother Adler-Royal Facit Hermes Canon Silver-Reed Remington Rand	Xerox 3M Swintec

¹⁴ Boggs et al, *U.S. Electronic Typewriter Markets: A Strategic Analysis 1982 – 1987* (Venture Development Corporation Report, 1982), 23.

While IBM was on the decline, Olivetti and Xerox were the two companies that quickly surged closer to the top of the ET industry. Xerox was able to match IBM in terms of market share after just two years in the industry. The company benefited from a large amount of capital and resources that came with being a large diversified corporation. To prove its dedication to the ET industry, Xerox used its highly regarded copier and duplicator sales force to sell ETs. It was the first time that the company used its primary sales force to promote a product that was not a copier.¹⁵ Olivetti became a major competitor in the industry because they produced superior products.

Both IBM and Xerox benefited from the fact that many retailers only carried one or two brands in their stores in the early 1980s. In fact, in 1984 a poll by market research firm Dataquest revealed that 80% of retailers offered two brands or less.¹⁶ IBM products were very attractive to retailers because they offered profit margins of 40% to dealers that ordered more than 60 new ETs. Most of the other companies in the industry had machines that offered profit margins of approximately 30%.¹⁶ Also, IBM could produce more ETs than the competition due to its fully automated production facility in Lexington, Kentucky. If not for the high profit margins, IBM might have relinquished its position as one of the market leaders.

With the arrival of these new entrants, the ET industry also became a global business. In 1981, firms from Japan, Germany, Sweden, and Switzerland joined companies in Italy and the United States to add to the diversity of the industry. In addition to being spread out across the globe, there was great diversity in the size of the companies. Firms with long histories of success and a wide range of product offerings

¹⁵ "Xerox Unveils Four Models of Electronic Typewriters," *Dow Jones News Service*, 17 November 1981.

¹⁶ "IBM's New Typewriter May Increase Pressure in a Booming Market," *The Wall Street Journal*, 17 October 1984.

such as IBM and 3M highlighted one end of the market. On the other end, Contitronix was a competitor despite being a \$5 million company that produced only ETs.

In addition to being aided by the large number of new entrants, the growth of the ET industry can also be attributed to Olivetti's introduction of a consumer ET in 1981.¹⁷ Prior to 1981, all ETs produced were office ETs (or business ETs) designed primarily to suit the needs of employees in the medical, financial, educational, and legal professions. Thus, consumer ETs effectively broadened the market for ETs to include both businesses and household users. In just two years, the consumer ET industry was valued at over \$100 million.¹⁸

The rapid growth of the consumer ET industry was fueled by technological advancements that greatly reduced the cost of computer chips. As mentioned earlier, all ETs had microprocessor chips that enabled the machines to perform more advanced functions than electromechanical typewriters. Designing a typewriter with fewer parts was important because the cost of labor started to rise significantly in 1983.¹⁹ Therefore, consumer ETs were an attractive product for companies in the ET industry as well as companies not in the ET industry because production costs were relatively cheap and it appeared that demand would continue to increase over time.

The combination of low production costs, low labor costs, and strong demand for ETs caused the ET industry to explode in 1984. Figure 1 shows the total shipments of ETs by year, while Figure 2 displays the total value of the ET industry by year. Both graphs illustrate the significant growth rates that appeared between 1983 and 1985.

¹⁷ "Olivetti to Unveil Two Portable Electronic Typewriters," *Dow Jones News Service*, 31 December 1980.

¹⁸ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 20.

¹⁹ Ellen Roseman, "It's Taps for the Old-Fashioned Typewriter," *The Globe and Mail*, 25 August 1983.

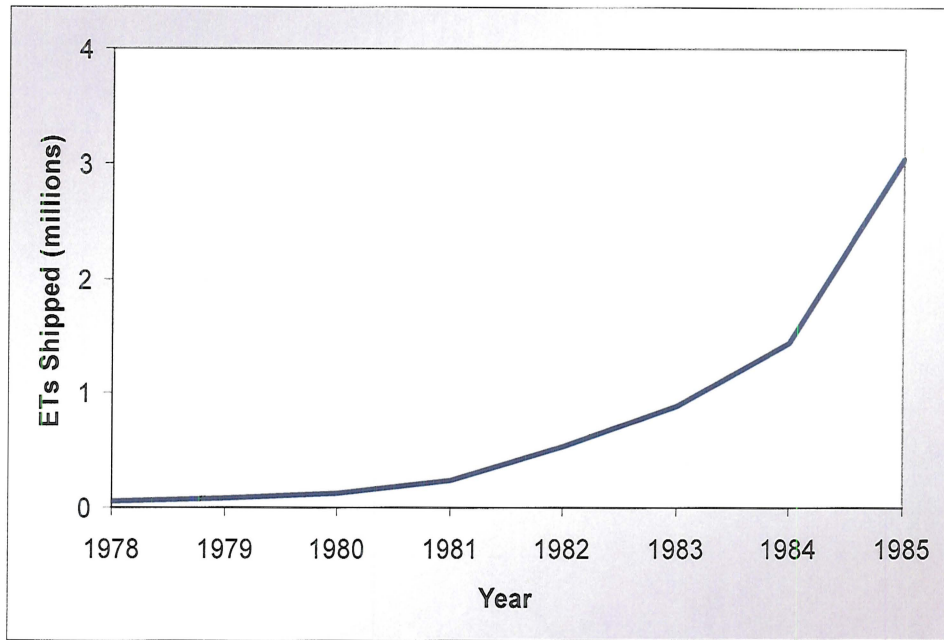


Figure 1: Total ET Shipments

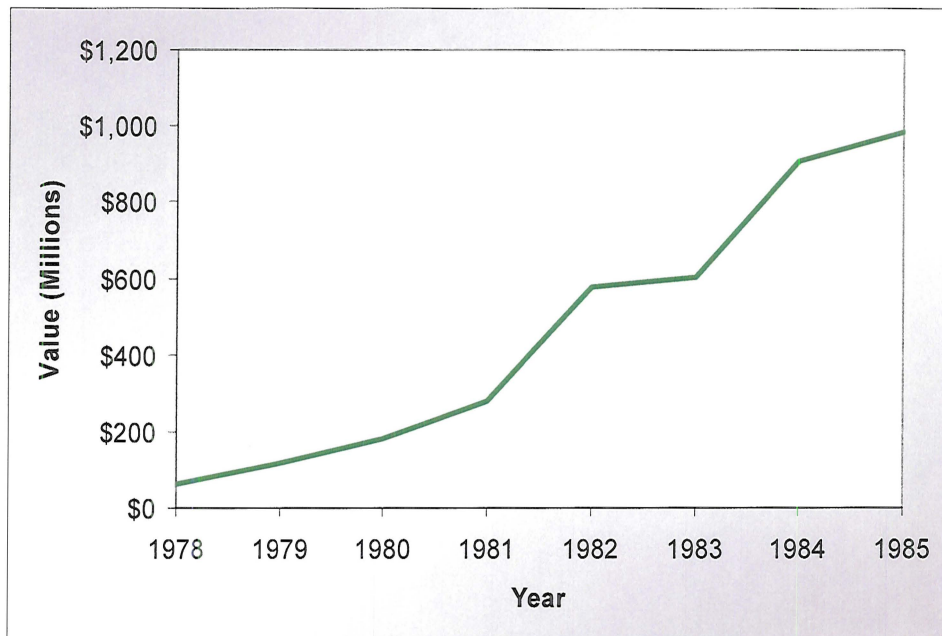


Figure 2: Total Value of the ET Market

Figures 3 and 4 show a more detailed description of ET shipments and overall market value by separating the office and consumer ET segments. Perhaps the most interesting deduction that can be made from Figures 3 and 4 is that consumer ET shipments surpassed office ET shipments in 1984 yet office ETs still generated considerably more revenue.

3.2 The Electronic Typewriter Industry Matures

In terms of total value, 1986 represented the peak year for the ET industry as the market was estimated to be worth \$1.25 billion.²⁰ The market was aided by a record number of competitors that produced a record number of new ETs. In 1986, a typical month would include at least one new product announcement from IBM, Canon, Xerox, or Panasonic. While the total dollar value of the ET market reached its apex in 1986, total ET shipments were at their highest in 1987.²¹ The reason why shipments peaked a year later was due to the intense competition in the industry. In other words, shipments increased but the overall value of the market decreased because competition forced manufacturers to lower prices for their ETs.

Consumer ETs finally surpassed business ETs in terms of value in 1987. Figure 5 compares the value of consumer ETs and business ETs. There were two reasons why consumer ETs outsold business ETs. First off, many home users became familiar with

²⁰ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 20.

²¹ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 18.

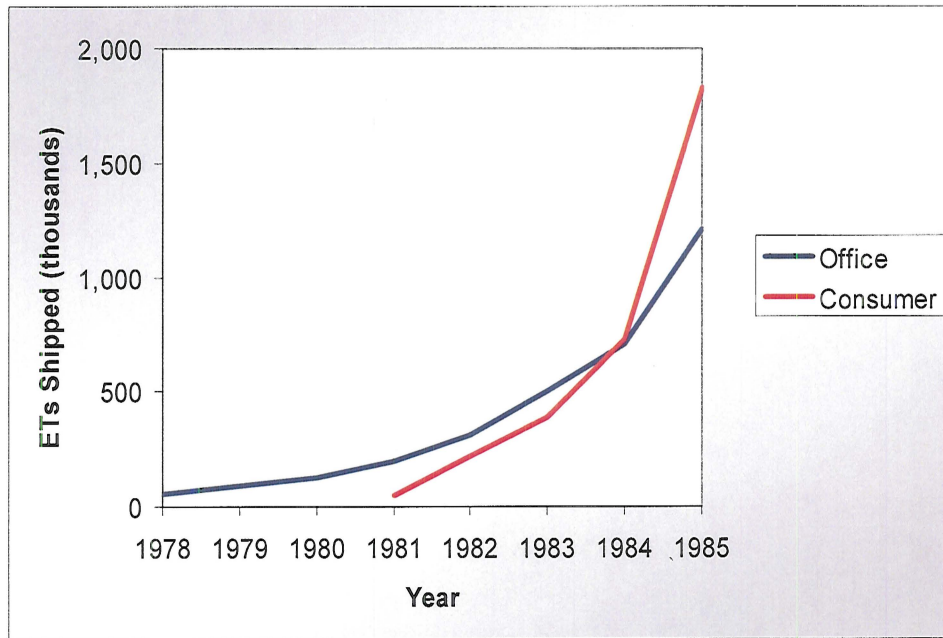


Figure 3: Total ET Shipments by Category

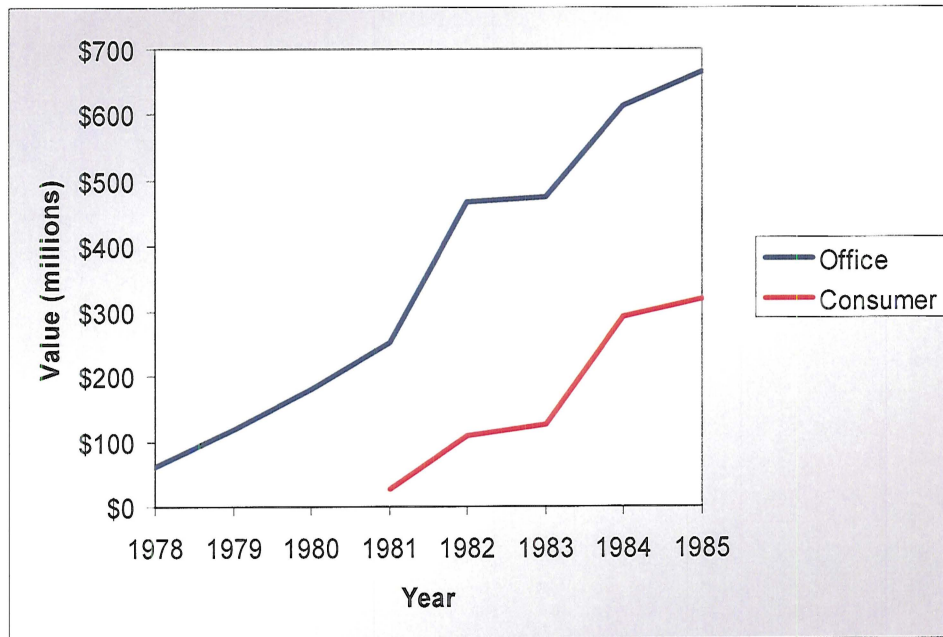


Figure 4: Total Value of the ET Market by Category

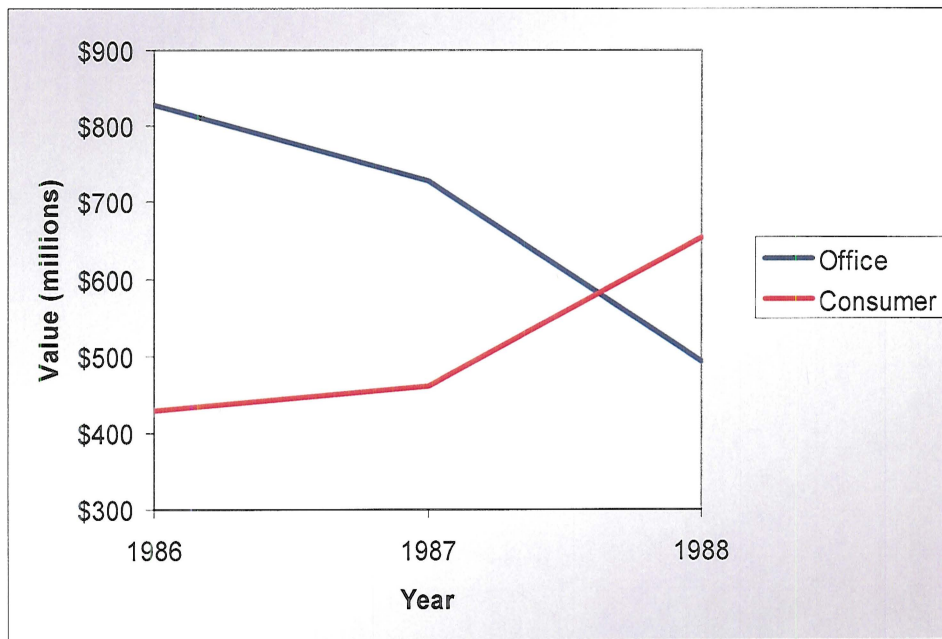


Figure 5: Total Value of the ET Market by Category

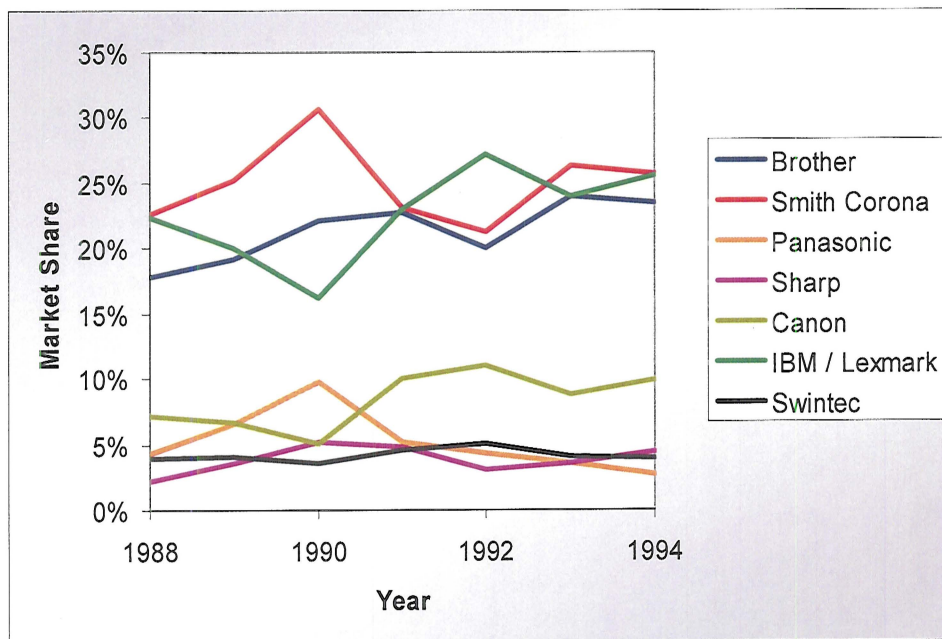


Figure 6: ET Market Shares Based on Market Value

ETs because they used them to perform their jobs. The increased exposure to ETs at work helped clarify the benefits that ETs provided. Second, many business customers started switching from ETs to computer systems toward the end of 1987. The transition to computers was an easy decision for many firms because computer software companies finally started releasing software that was user-friendly.²² Individual consumers could not afford the steep prices for personal computers so demand for consumer ETs remained healthy.

During the first peak year for the ET market, Smith Corona and IBM were the two market leaders (see Figure 6). Both companies held approximately 22% of the market. For the most part, Smith Corona focused exclusively on consumer ETs and the company was able to profit handsomely since the consumer ET market was still on the rise.²³ Just as Smith Corona benefited because they were primarily in the consumer ET industry, IBM suffered because they focused almost exclusively on office ETs. Therefore, while IBM still held approximately 48% of the office ET market, their share of the overall market was only 22%. Other companies, such as Swintec and Panasonic, produced both consumer ETs and office ETs and their lower positions in the market could be linked to the declining popularity of office ETs.

3.3 The Decline of the Electronic Typewriter Industry

The intense competition in the ET market eventually caused the value of the industry to plummet. The large number of competitors made it very difficult for any firm to turn a profit since prices had to be continuously lowered. Figure 7 shows the average

²² Laura Liebeck, "Give Me Capability," *Discount Store News*, 9 January 1989.

²³ "Smith Corona and Brother Revitalize Typewriter Market," *Financial Times*, 17 August 1988.

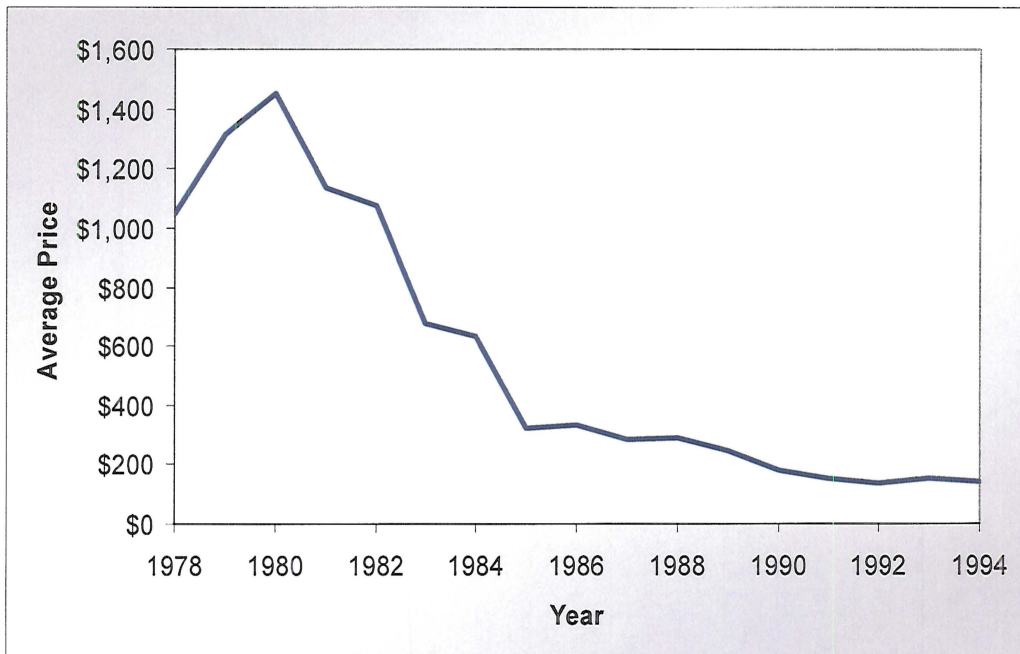


Figure 7: Average Price of ETs by Year

price of an ET from 1978 to 1994. As shown in this graph, for the ten year period from 1980 to 1990, the average price of an ET dropped by \$1,200. By 1994, the price of an ET was less than \$200. Also, referring again to Figure 6 above, the statement made by many market analysts that the key to combating lower prices was the development of a strong brand name was confirmed.²⁴ The three market leaders all possessed one.

A major mistake made by ET manufacturers was an inability to market their products successfully against computers. According to Venture Development Corporation, a market research firm, manufacturers needed to position ETs as being easier to use than personal computers. This was especially important given that computer software companies were rapidly improving their design and user interfaces.²⁵ Also, prices for simple personal computers started to approach prices for ETs. In 1989, a full computer system could be purchased for as little as \$1,200, which was just a few hundred dollars more than the price of an ET.²⁶

IBM's decision to exit the ET market in 1990 also contributed to the decline of the overall industry. IBM decided to spin off its production of ETs when they created a new company named Lexmark.²⁷ Not surprisingly, IBM decided to focus on the growing PC and software industries as opposed to the declining ET industry. Lexmark's first move was to change how customers perceived ETs. Instead of promoting ETs as substitutes for computers, Lexmark chose to explain how ETs served as complements to computers. The company showed how many common business tasks, such as printing

²⁴ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 1.

²⁵ Paul B. Carroll, "Computer Firms Step Up Efforts to Make Machines Easier to Use," *The Wall Street Journal*, 14 December 1987.

²⁶ T.R. Reid, "A Word of Advice on Personal Word Processors," *The Washington Post*, 3 March 1986.

²⁷ Nathaniel Gilbert, "Lexmark's Life After IBM," *Financier*, August 1991.

envelopes and packing slips, could be accomplished quicker with the use of an ET instead of a computer.²⁸ The justification for their new positioning strategy was data which revealed that 90% of the company's ET customers also owned at least one personal computer.²⁹ As a result, Figure 6 illustrates that Lexmark was able to reverse its trend of decreased revenues after 1990.

In addition to a new positioning strategy, Lexmark also benefited when Smith Corona, Xerox, and Brother exited the office ET market in the early 1990s.³⁰ Figure 8 shows the percentage of the office ET market held by each firm and it also depicts the years when the three aforementioned companies left the market. According to Figure 8, Lexmark started to increase its market share toward the beginning of 1990. Not coincidentally, both Xerox and Smith Corona exited a year earlier. Therefore, business customers that wished to purchase a brand name office ET elected to go with a Lexmark model because it was clearly the most recognizable brand that remained. Even though Smith Corona left the office ET segment of the market, they continued to be the market leader for consumer ETs. The graph in Figure 9 shows that Smith Corona and Brother were the two dominant consumer ET manufacturers.

Figures 10 and 11 illustrate the continuous decline of the ET industry in terms of total shipments and overall value. Between 1989 and 1994, total shipments of ETs decreased from 3.9 million to 1.7 million. Similarly, the value of the market declined

²⁸ Patricia M. Fernberg, "Electronic Typewriters: Today's Indispensable Productivity Tool," *Managing Office Technology*, 1 March 1989.

²⁹ Peter H. Lewis, "Lexmark Still Key Player in Typewriter Market," *Portland Oregonian*, 4 August 1993.

³⁰ Kate Evans-Correia, "Where Have All the Typewriters Gone?," *Purchasing*, 24 October 1991.

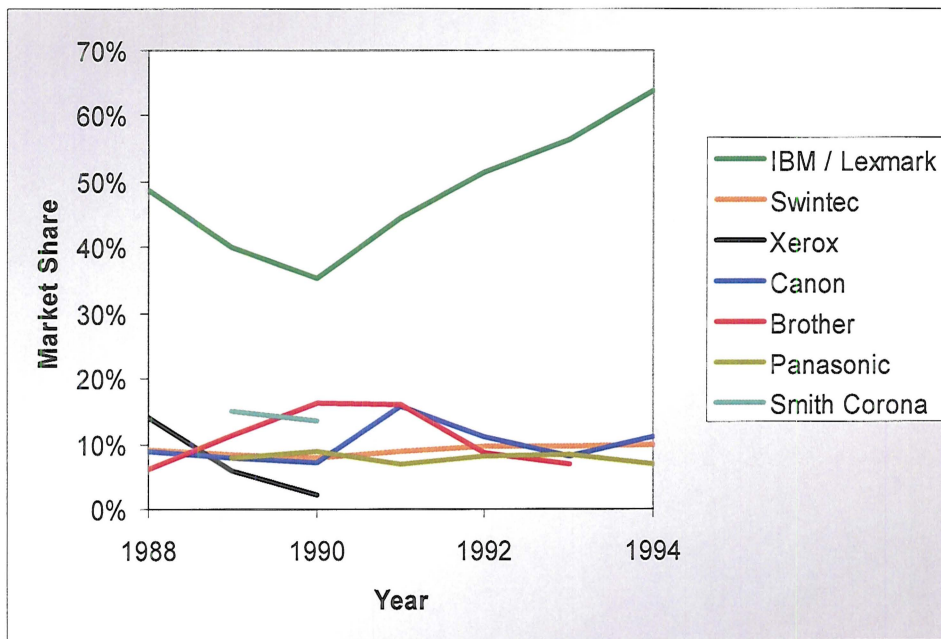


Figure 8: Office ET Market Shares Based on Market Value

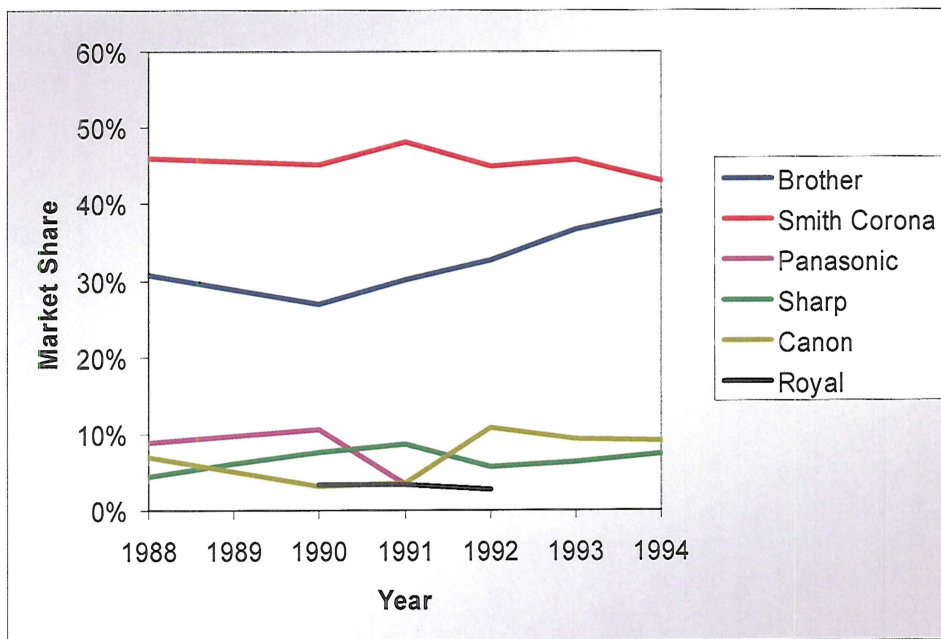


Figure 9: Consumer ET Market Shares Based on Market Value

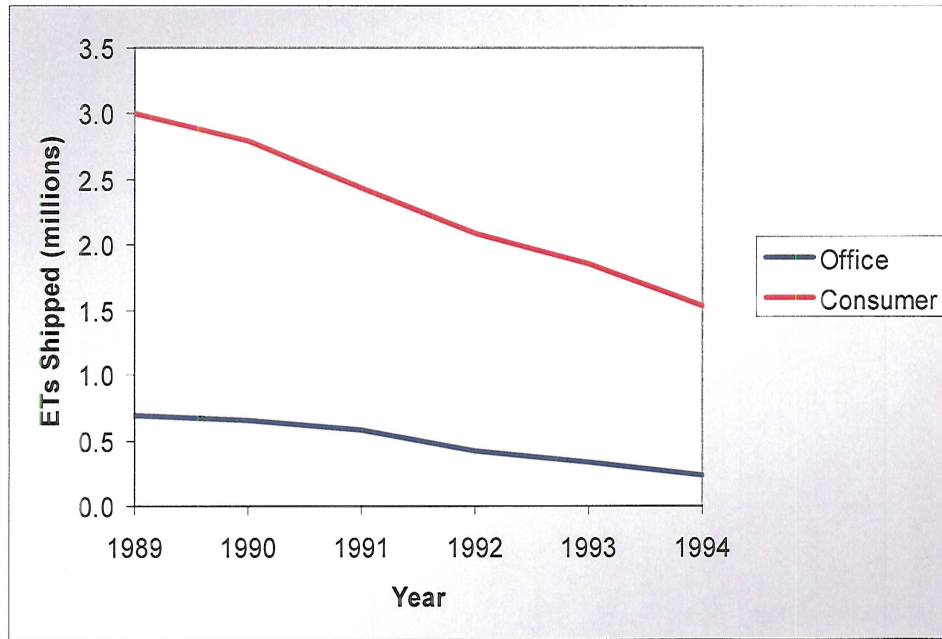


Figure 10: Total ET Shipments by Category

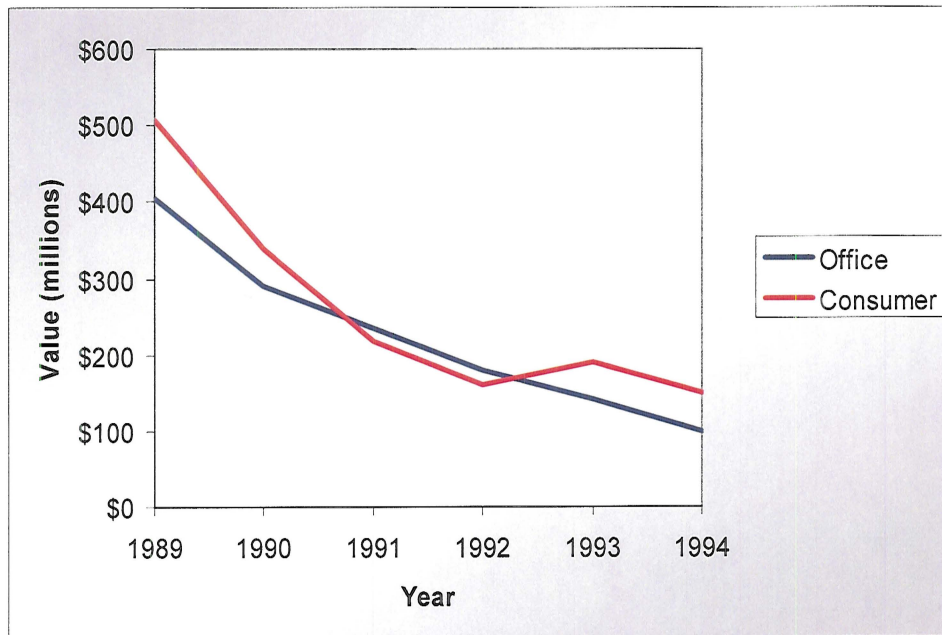


Figure 11: Total Value of the ET Market by Category

from about \$900 million to \$250 million. Figures 10 and 11 also reveal another interesting result. From 1991 to 1992, the value of the office ET segment of the market was actually greater than the value of the consumer ET segment. This was most likely a result of Lexmark's ability to convince businesses that an ET should be used to complement computers in the workplace. However, it is apparent from both graphs that the ET industry was in a constant decline and there was little hope of revival for those firms still present in the industry. As a recap, Figures 12 and 13 show ET shipments and the ET market value for every year from 1978 to 1994.

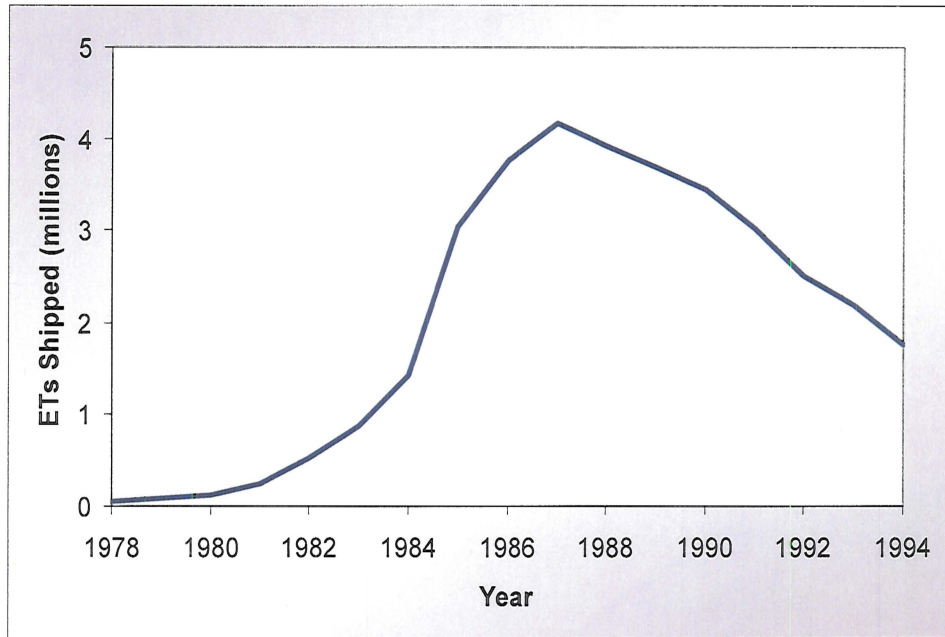


Figure 12: Total ET Shipments by Year

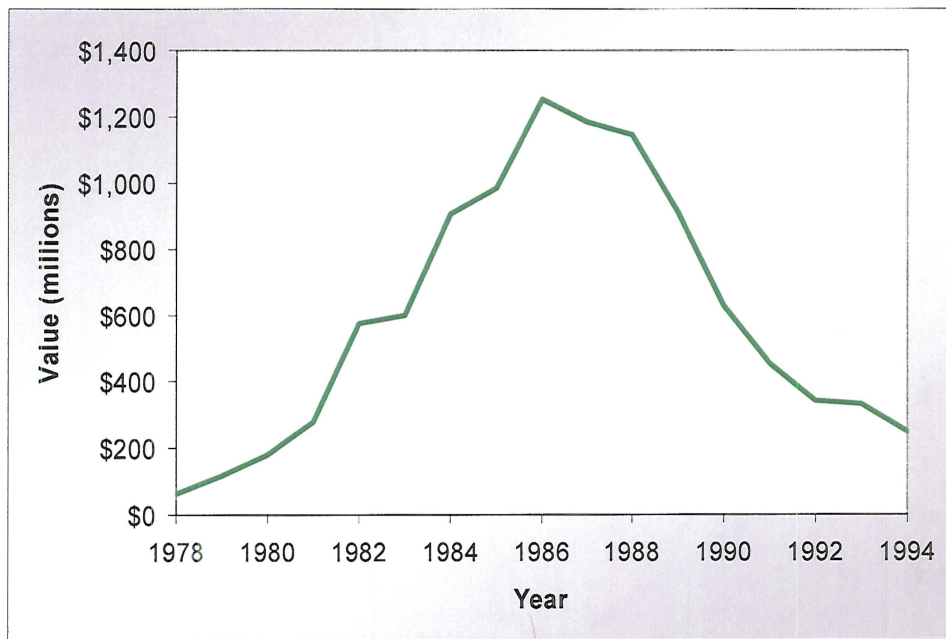


Figure 13: Total Value of the ET Market by Year

4. History of Personal Word Processors

4.1 Introduction of the Personal Word Processor Industry

The first ever personal word processor (PWP) that came into the market was the PWP 12 manufactured by Smith Corona. This new product did not garner nearly as much attention as the Intelligent Typewriter Level 1 ET. Since the PWP was not a radically new invention like the ET, it was not seen as a hot commodity initially. Also, with the ET firmly entrenched in offices around the country, PWP manufacturers faced the daunting task of creating demand for a new product that was basically just a more glamorous ET. However, PWP companies were confident that they could convince businesses and household users to purchase PWPs. Their confidence was based on data which revealed that computer users spent nearly 75% of their time performing word processing functions.³¹ Thus, PWP firms believed that if they focused on creating a specialized device to handle more advanced word processing functions that considerable profits could be realized.

Smith Corona's introduction of the PWP 12 helped the company become the market leader for PWPs in 1988. Figure 14 displays the major firms in the PWP market and provides the share of the market held by each firm. Smith Corona's main marketing goal was to convince potential customers that their PWPs provided sophisticated word processing applications that were much easier to use than word processing programs that were run on computers. In addition to their current crop of customers, the company targeted two additional segments that were not pursued heavily by ET manufacturers:

³¹ "Survey Results Show 77 Percent of Home PC Owners Use PC's Mainly for Word Processing and Spreadsheets," *PR Newswire*, 9 January 1990.

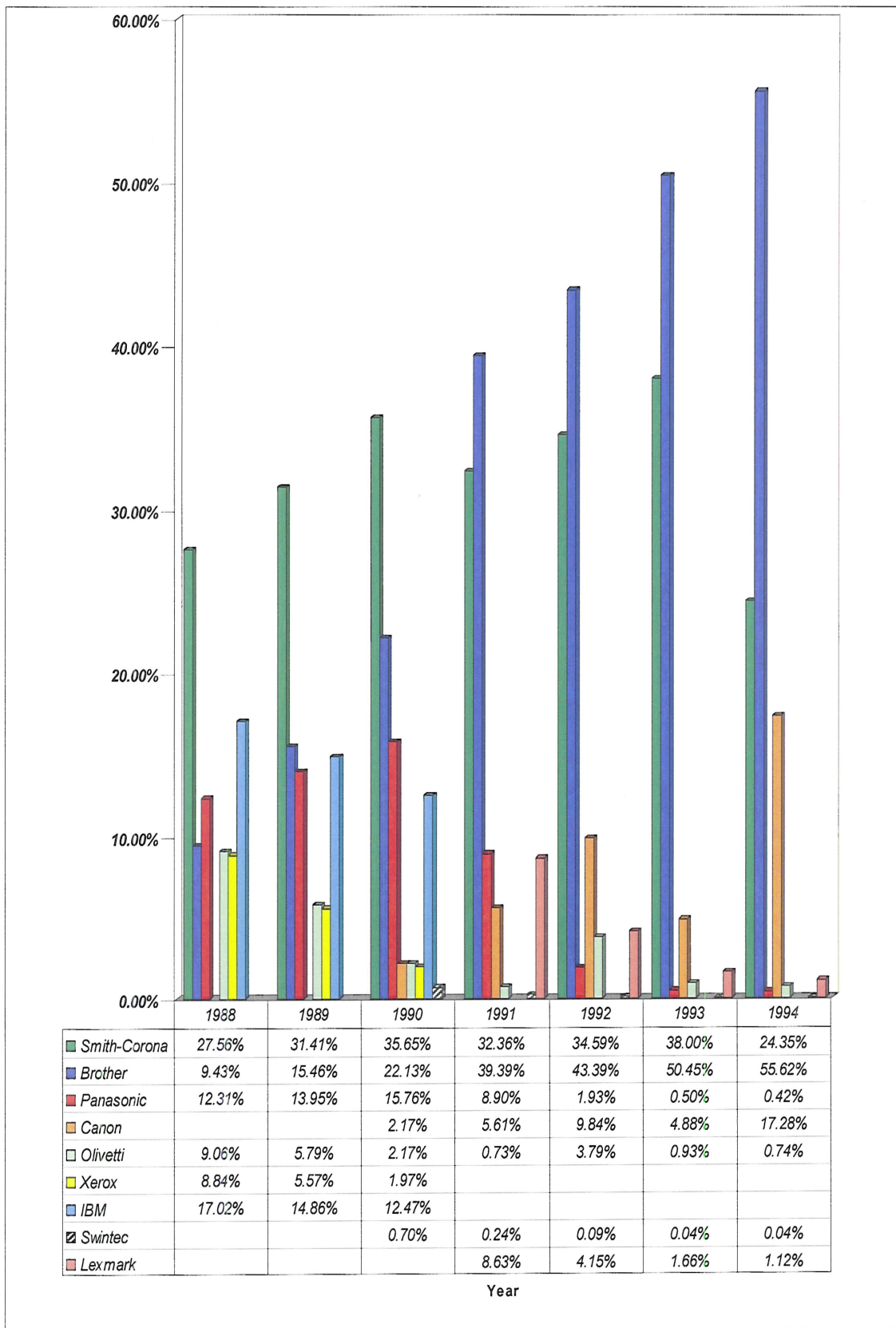


Figure 14: PWP Market Shares Based on Market Value

college students and retirees.³² This target market was a logical decision since Smith Corona developed a competitive advantage in the ET industry by serving household consumers as opposed to business customers. Since the number of students attending colleges and universities was rapidly increasing in the late 1980s and early 1990s, Smith Corona's prospects looked promising. Also, Smith Corona believed that retirees were an attractive target because they reasoned that many retirees did not want the complexities associated with using computers.

While Smith Corona was the clear market leader in 1988, five other firms aggressively fought to be in the second position: Brother, Panasonic, Olivetti, Xerox, and IBM. All five of these firms held a similar portion of the market, but it appeared that Brother would become Smith Corona's main opponent. It was apparent that in the late 1980s and early 1990s that IBM and Xerox were more interested in computers and software development.³³ Panasonic and Olivetti were in the ET market and neither became a major threat. Since Brother achieved success in the ET market, many believed that they had the best chance to challenge Smith Corona by leveraging their existing knowledge and capabilities. Furthermore, even though Brother was fourth in market share in 1988, they were second in percent of overall PWP shipments (see Figure 15).

Thus, not many industry analysts were surprised when Brother claimed the second spot in the PWP market just one year later. Between 1988 and 1989, Brother raised its market share from approximately 9.5% to 15.5%. Meanwhile, IBM, which was second in 1988 with 17%, fell to the third position with a share of 14.86%. Smith Corona also strengthened its hold on the top spot by increasing its share by almost 4%. The company

³² James A. McConville, "Word Processors, Typewriters Shift: One Market Ballooning, Other Flat," *The Weekly Home Furnishings Newspaper*, 28 August 1989.

³³ Kate Evans-Correia, "Where Have All the Typewriters Gone?," *Purchasing*, 24 October 1991.

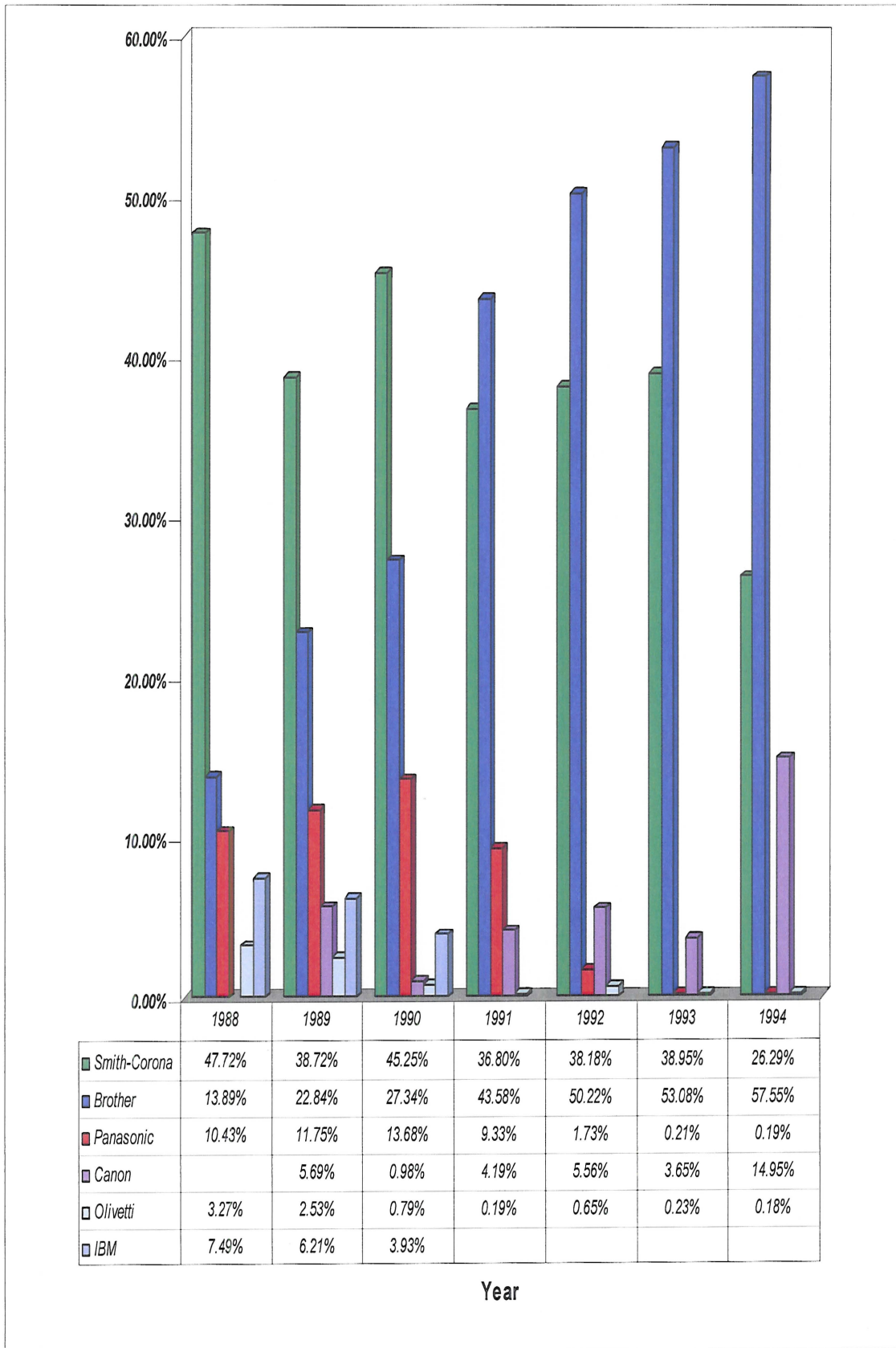


Figure 15: PWP Market Share Based on Total Shipments

utilized a unique marketing medium to attract some of their targeted customers. Since college students were part of their target market, Smith Corona ran advertisements for their products in movie theaters.³⁴ Most college students enjoyed watching movies and going to theatres, so running advertisements before movies increased awareness of their PWP's and helped contribute to the company's growth in the industry.

4.2 Growth and Development of the Personal Word Processor Industry

The growth and development era of the PWP industry can best be described as a tenacious battle between Smith Corona and Brother for market leadership. Between 1990 and 1993, both companies released new PWP models at a rapid pace. Smith Corona tried to use its strong brand name and solid reputation to sway customers while Brother offered their products at lower prices. In 1991, Brother was able to supplant Smith Corona as the market leader and they would never relinquish their position. Ultimately, Brother's low pricing strategy was too much for Smith Corona to overcome. Brother could offer much lower prices because their products were produced outside the U.S. whereas Smith Corona manufactured their products inside the U.S. Therefore, Brother's cheap labor costs were reflected in their lower PWP prices.

The marketplace battle between Smith Corona and Brother eventually spilled into the courtroom. In 1993, Smith Corona filed a series of lawsuits accusing Brother of selling their PWP's at unreasonably low prices.³⁵ They argued that Brother was trying to drive them out of business. The war went back and forth for about three years until both companies finally decided to stop the argument. The battle concluded after both

³⁴ Philip H. Dougherty, "Movie Ads for Word Processor," *The New York Times*, 5 November 1987.

³⁵ "Japanese Word Processor Makers Accused of Dumping," *Japan Economic Newswire*, 8 November 1990.

companies realized they were fighting for a dying market. After the court battle, Smith Corona tried to revitalize its PWP business by moving their manufacturing operations to Mexico.³⁶ However, the time and money they spent fighting Brother in court seemed to drain the company of its drive and energy.

While most of the industry was focused on the tug of war between Brother and Smith Corona, IBM and Xerox quietly exited the PWP market in 1991. As mentioned earlier, IBM spun off its typewriter businesses and created Lexmark. However, Lexmark was not as dedicated to the PWP market as they were to the ET market. After both IBM and Xerox exited the market, Canon made an interesting decision when they decided to enter the PWP market in 1990. It was a curious decision since most industry analysts felt that the market had meager growth prospects and that Canon would have a very difficult time competing with Smith Corona and Brother. Nevertheless, Canon entered the PWP market and was able to claim nearly 10% of the market after two years.³⁷ Canon's quick success was due to their innovative ink-jet printer capabilities that they provided with their PWP's. Also, they were able to absorb the market share that was available after Xerox and IBM left the market as well as steal market share from a weakened Smith Corona. By 1994, they almost matched Smith Corona in terms of market share.

4.3 The Decline of the Personal Word Processor Industry

Interestingly, the same forces that led to the demise of the ET industry contributed to the decline of the PWP industry. First and foremost, the competitive nature of the PWP market made it very difficult for firms to earn profits. As shown in Figure 15, by

³⁶ Martin Dickson, "Smith Corona to Close its Last US Typewriter Manufacturing Plant," *Financial Times*, 22 July 1992.

³⁷ Sandy Plunkett, "Canon Goes Back to the Future," *Business Review Weekly*, 31 August 1990.

1994 only three firms were able to withstand the effects of intense competition. However, one of the three companies that survived, Smith Corona, filed for Chapter 11 bankruptcy protection in 1995³⁸ and another, Canon, entered the market late. This meant that Brother was the only firm that successfully survived from beginning to end. Further, Figure 16 shows how PWP prices were affected by competition.

Another major problem that plagued the industry was an inability to convince businesses to purchase PWPs. Many businesses did not want to purchase PWPs because they were more interested in computer systems. During the early 1990s, many companies favored the push toward an integrated workplace that allowed data to be freely exchanged across the entire organization. The only way that this could be accomplished was through the use of a network that utilized computers. Therefore, PWPs were not seen as desirable products. It did not make sense to buy a PWP that served as a complement to a computer when most of the required organizational tasks could be performed solely by a computer. Firms still used their ETs for the few tasks that could not be handled efficiently by computers and printers, such as printing envelope labels.

Generally speaking, during the final years of the industry, PWPs were classified into two major groups: PWPs that had a cathode ray tube (CRT) or liquid crystal display (LCD) screen and PWPs that were computer-oriented. Most of the major PWP firms mentioned above sold CRT/LCD PWPs as opposed to computer-oriented PWPs. The CRT/LCD PWPs were more user-friendly machines while the computer-oriented devices were intended for technologically proficient users. Computer-oriented PWPs were more

³⁸ "Smith Corona Seeks Bankruptcy Protection," *The Pantagraph Bloomington, IL*, 6 July 1995.

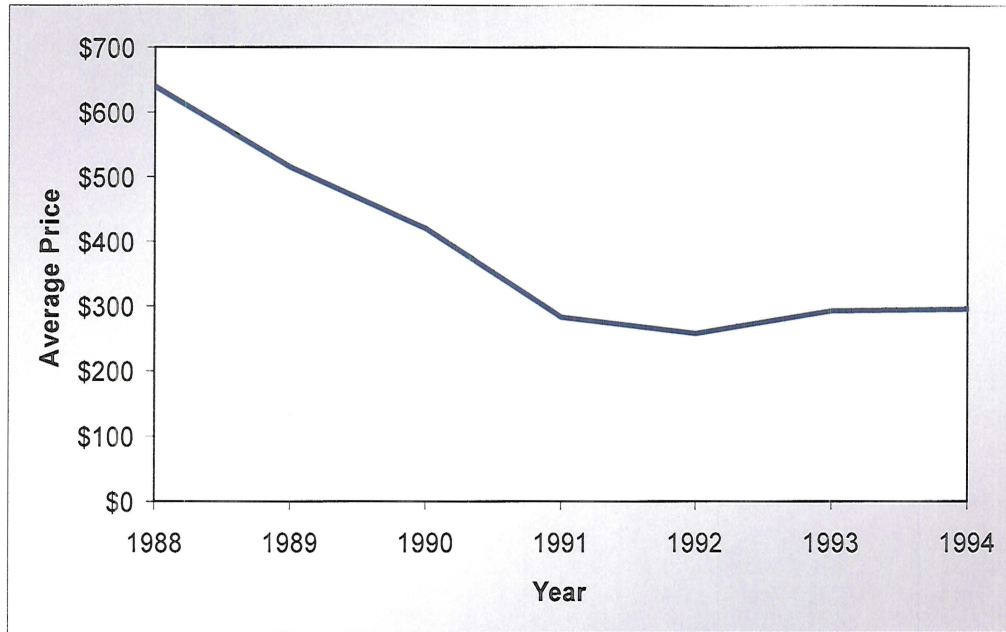


Figure 16: Average PWP Prices by Year

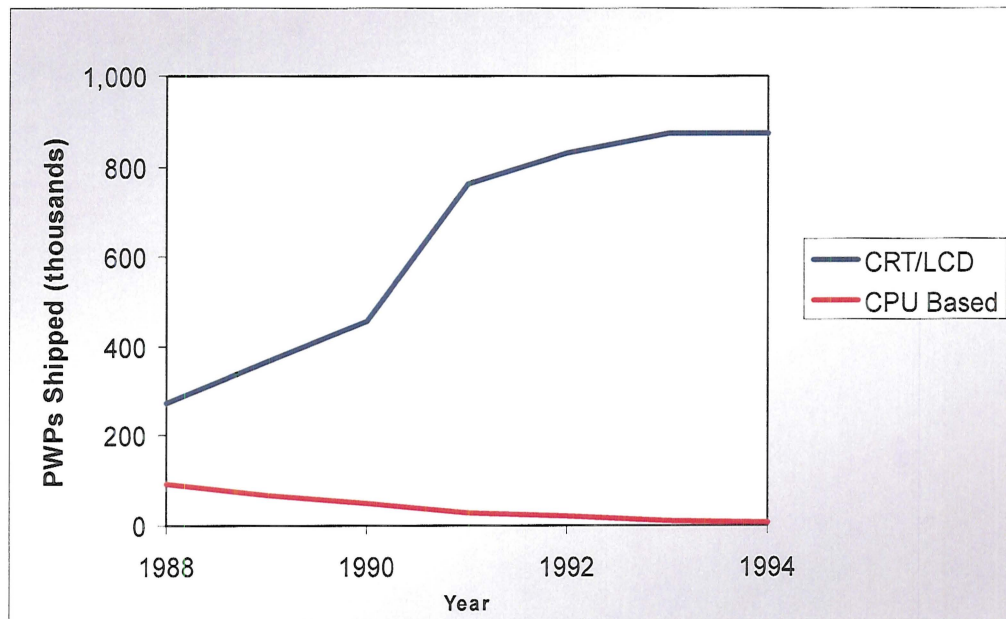


Figure 17: PWP Shipments by Type

difficult to use because they contained more applications.³⁹ Figure 17 compares the number of units shipped for the two groups from 1988 to 1994. Basically, the CRT/LCD type dominated the computer-based PWP for the pure reason that many consumers did not want the headaches associated with advanced technology. After all, household users simply wanted a typing machine that was more sophisticated and easier to use than an ET.

Figure 18 shows the total value for both PWP groups. Not surprisingly, the CRT/LCD models accounted for the majority of the market's value. However, the value of this market never exceeded \$300 million, which indicated that the market for PWPs was never a significant threat to computers or other technological devices. The computer-based PWP market failed because the targeted customers for the product were not interested in purchasing the product. Thus, only one year after this market was established, the overall value of the market declined by almost 50%. Only five years later, the market for computer-based PWPs was practically non-existent.

³⁹ Haggerty et al, *The Electronic Typewriter Industry 1995* (Venture Development Corporation Report, 1995), 35-39.

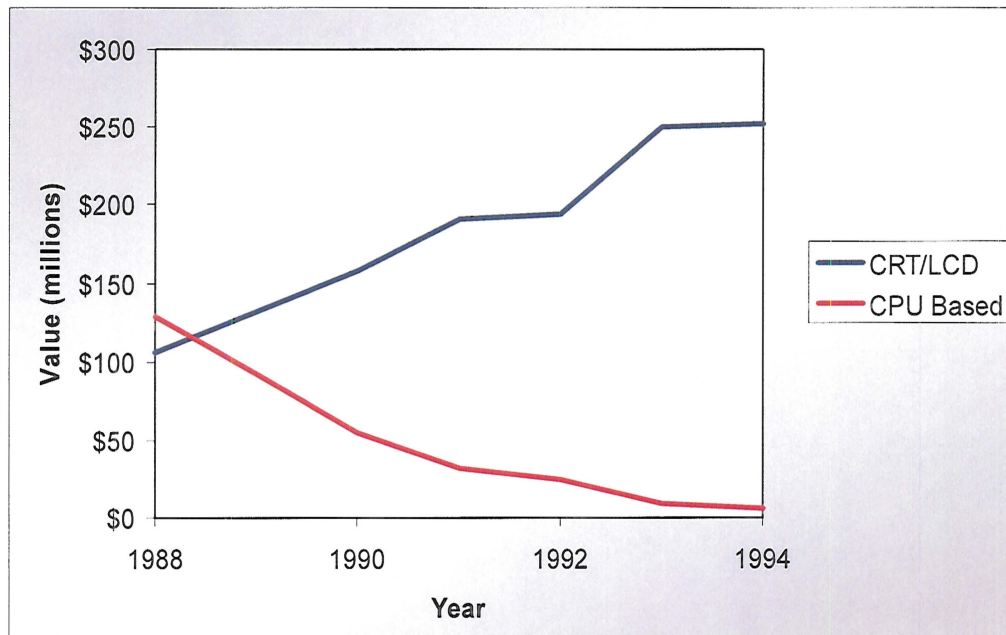


Figure 18: Total Value of the PWP Market by Type

5. Conclusion

In the end, the rapid advancements in computing technology eliminated the need for PWP's as well as ETs. During the mid 1990s, computer hardware became significantly cheaper, and as a result, prices for computers declined dramatically. They were also easier to use and easier to connect to other devices. Perhaps equally as important as hardware developments were software improvements. Software enabled computers to gain additional functionality and upgradeability, improvements that simply could not be efficiently realized on a PWP. As computers became more popular in businesses and homes, production costs could be lowered even further through economies of scale. All of these benefits, as well as many others, contributed to the meteoric rise of computer systems and the end of typewriters.

6. Company Profiles

6.1 Adler-Royal

Unlike most of the other firms in the industry, Adler-Royal was not an independent company. Rather, Adler-Royal was the U.S. marketing company of Triumph Adler of West Germany. Essentially, Triumph Adler wanted to maintain close relationships with its customers. Since the majority of their customers were in the U.S., it was a logical decision to create a subsidiary in the U.S. Ensuring that customers were satisfied was a critical area of focus for many ET firms. Given that the ET market was very competitive, if business customers felt that their needs were not being addressed by a particular firm, then they could easily switch to a different firm. Adler-Royal's customer-focused behavior helped the company establish a respectable brand name in the industry.

Adler-Royal also developed a sound product development strategy. The company decided to focus almost exclusively on basic models. During the early 1980s, basic units were in high demand as most firms were looking for a simple device to print small business letters, envelope labels, or packing slips. Also, since IBM and Xerox were aggressively competing for market share at the high-end of the market, it would have been very difficult for Adler-Royal to break through in that segment. Further, Adler-Royal was aided by the gradual polarization of the ET market. Customers either sought a basic ET or a high-end model. Since Adler-Royal was well respected in the basic ET market, they were able to capture almost 9% of the office ET market in 1987. The

company was not active in the PWP market and they offered only a few models. Like most other firms, Adler-Royal exited the typewriter business in the middle of the 1990s.⁴⁰

Adler-Royal Facts⁴¹:

Table 4: Adler Royal Facts

Competitor in the ET Market	Yes
Entered ET Market	1981
Largest Office ET Market Share	9% (1987)
Competitor in the PWP Market	Yes
Entered PWP Market	1990
Largest PWP Market Share	---
Product Focus	basic
Target Market	small and mid-size firms

⁴⁰ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 170-171.

⁴¹ Market entry dates as well as market shares are approximates.

6.2 Brother

Brother was one of the most successful firms in the ET and PWP markets. Since the company had been involved in electric typewriters, they were able to leverage their typewriter competences and quickly enter the ET market in 1981. Brother remained in the ET industry until the end and they were able to steadily increase their market share over time. They were the second best company in terms of market share in both the consumer and office ET markets. A reliance on foreign manufacturing was critical to Brother's success. Since Brother was based in Japan, they manufactured their ETs outside of the U.S. and could take advantage of significantly low labor costs. With the money saved on labor, Brother could commit more money toward the research and development of new ET models. Thus, it was not surprising that Brother aggressively introduced new products into the ET market.

While Brother was only the second best firm in the ET market, they were able to achieve dominance in the PWP market. Beginning in 1988, Brother was able to increase its share of the PWP market every year until 1994. By 1994, they owned more than half of the market. However, their success did not come without controversy. In the early 1990s, Brother's main competitor in the PWP market, Smith Corona, accused Brother of selling their PWPs at unreasonably low prices. Even though the courts agreed with Smith Corona⁴², Brother was never severely affected because the consequences of the decisions were minor. In the end, Brother was able to successfully survive the intense competition of the ET and PWP industries and they continue to do business today. The company specializes in producing, among other things, sewing machines and printers.

⁴² Anne Veigle, "Duties Put on Word Processors from Japan," *The Washington Times*, 9 August 1991.

Brother Facts⁴³:**Table 5: Brother Facts**

Competitor in the ET Market	Yes
Entered ET Market	1981
Largest ET Market Share	24% (1993)
Competitor in the PWP Market	Yes
Entered PWP Market	1985
Largest PWP Market Share	55.62% (1994)
Product Focus	basic, mid-range, and high-end
Target Market	all types of firms and households

⁴³ Market entry dates as well as market shares are approximates.

6.3 Canon

Even though Canon was first established as a camera business during the 1950s, they decided to enter the ET market in 1981. They were lured into the ET industry with the hope of achieving growth rates similar to IBM. However, Canon lacked the skills and expertise of IBM and was not as aggressive as Xerox, so they only earned modest success in the industry. Since Canon did not earn high profit levels in the industry, they relied heavily on the international market to manufacture their products at lower costs. Mexico and Taiwan were the locations of two of the larger manufacturing operations.⁴⁴ Canon reached its peak in the ET industry in 1992 when they had an 11% share of the market.

While Canon did not make major waves in the ET industry, they made a greater imprint on the PWP industry.⁴⁵ Canon entered the PWP market in 1990 after both IBM and Xerox exited. It appeared that their goal was to claim some of this newly vacant market share by introducing innovative products. As it turned out, Canon was able to earn a significant piece of the market with their innovative ink-jet printer capabilities that they provided with their PWPs. This new product enabled the company to claim more than 17% of the market by 1994. Today, Canon has returned to producing numerous types of cameras, printers, and projectors.

⁴⁴ Klein et al, *Electronic Typewriter Planning Service 1992* (Venture Development Corporation Report, 1992), IV-94 – IV-95.

⁴⁵ Caroline Louis, "Canon's New Series of Electronic Typewriters," *The New Straits Times*, 28 November 1996.

Canon Facts⁴⁶:**Table 6: Canon Facts**

Competitor in the ET Market	Yes
Entered ET Market	1981
Largest ET Market Share	11.02% (1992)
Competitor in the PWP Market	Yes
Entered PWP Market	1990
Largest PWP Market Share	17.28% (1994)
Product Focus	basic and mid-range
Target Market	small firms and household consumers

⁴⁶ Market entry dates as well as market shares are approximates.

6.4 IBM

Although IBM was beaten to the market by Qyx in 1978, the company was still able to earn more than 90% of the ET market by the end of the year. IBM benefited tremendously from the solid reputation and large customer base that they formed through their involvement with business machines that preceded ETs. After a few years in the ET industry, IBM was considered by many to be “the typewriter company.” IBM served as a perfect example of how a strong brand name was critical for success in the ET market. Despite offering ETs with fewer features at higher prices than the competition, IBM was able to maintain its position as a market leader during the 1980s. In addition to a strong brand, IBM ETs were attractive products because they offered retailers high profit margins of 40%.

Another major competitive advantage for IBM was its \$350 million automated typewriter production plant in Lexington, Kentucky. Initially, the plant was created to produce IBM’s Selectric line of electric typewriters. As electric typewriters were phased out, IBM modified the production process so that ETs could be produced. The automated process enabled IBM to experience lower unit costs through economies of scale. The low unit costs combined with IBM’s high ET prices provided the company with a high profit margin. When IBM exited the typewriter market, Lexmark continued to use the plant.

While IBM was a market leader during the 1980s, their share of the ET market began to decline rapidly in the early 1980s as the market became saturated with competitors. With at least a dozen firms competing in the ET industry in the early 1980s, IBM’s market share quickly dropped from a high of 90% to a low of 20%. Even though their share was declining, IBM still increased its revenues yearly. However, as the

competition became even more intense toward the middle of the 1980s, IBM started to invest more capital and resources in the growing computer industry.

As an example of the rapid growth of the computer industry, IBM shipped more computers in the last eight weeks of 1983 than in 1981 and 1982 combined. Also, by the end of 1984, IBM shipped a computer every ten seconds.⁴⁷ Given that the total value of the personal computer market approached \$9 billion by the end of 1985, it was not surprising that IBM increased its commitment to computers in the 1980s. The computer industry provided opportunities for higher profits and IBM already had experience with hardware and software. Thus, in 1990, IBM exited both typewriter markets.

IBM Facts⁴⁸:

Table 7: IBM Facts

Competitor in the ET Market	Yes
Entered ET Market	1978
Largest ET Market Share	90% (1978)
Competitor in the PWP Market	Yes
Entered PWP Market ¹	1984
Largest PWP Market Share	17.02% (1988)
Product Focus	mid-range and high-end
Target Market	mid-size and large firms

⁴⁷ Dennis Kneale, "IBM Says Demand and Shipments of PC are Exceeding Company Expectations," *The Wall Street Journal*, 16 March 1984.

⁴⁸ Market entry dates as well as market shares are approximates.

6.5 Lexmark

In 1990, IBM decided to drop out of the ET and PWP markets, but in doing so, they created a new company, Lexmark, that would still manufacture and sell ETs and PWPs. IBM wanted to focus on the growing computer hardware and software industries. However, the IBM brand name appeared on products manufactured by Lexmark for five years, which obviously helped convince customers that products made by Lexmark would still be of high quality. Lexmark's first move was to change how customers perceived ETs. Their main goal was to convince business customers that ETs and PWPs should serve as complements to computers. Apparently, many business customers agreed with Lexmark's vision since Lexmark's office ET market share increased dramatically following 1990. Also, Lexmark was able to benefit when other large ET firms pulled out of the market in the early 1990s. In the latter stages of the ET industry, Lexmark was the dominant company in the market with a share of over 60%.

Even though the portable ET and PWP markets were in their final stages, Lexmark continued to earn success. In fact, they even had a few breakthroughs, such as their Diamond Series products. Another major victory came when Lexmark made a large sale of PWPs to the U.S. government in 1994.⁴⁹ Although Lexmark made valiant efforts to sell ETs and PWPs, they also developed new product offerings, such as printers, scanners and ink cartridges.

⁴⁹ Haggerty et al, *The Electronic Typewriter Industry 1995* (Venture Development Corporation Report, 1995), 85-87.

Lexmark Facts⁵⁰:**Table 8: Lexmark Facts**

Competitor in the ET Market	Yes
Entered ET Market	1990
Largest office ET Market Share	63.84% (1994)
Competitor in the PWP Market	Yes
Entered PWP Market	1990
Largest PWP Market Share	8.63% (1991)
Product Focus	mid-range and high-end
Target Market	mid-size and large firms, governments, and household consumers

⁵⁰ Market entry dates as well as market shares are approximates.

6.6 Olivetti

Olivetti was the first European company to enter the typewriter market. Soon after their entry in 1979, they were able to gain significant ground in the ET industry thanks to their superior products. However, Olivetti's greatest contribution to the ET industry came two years after their entry when they developed the Praxis 30 and the Praxis 35 consumer ETs. These two models were the first consumer ETs to enter the market. The Praxis 30 sold for \$595 while the more advanced Praxis 35 sold for \$600.⁵¹ Consumer ETs were developed to satisfy the needs of household consumers as well as small office customers. Typically, consumer ETs were smaller units that did not provide as many functions as an office ET, but their lower prices made them popular. In fact, total consumer ET shipments surpassed total office ET shipments in 1984.

Even though Olivetti introduced the first consumer ET, they were not able to reap the benefits of their early market entry. The company was quickly overshadowed by larger firms, such as Smith Corona and Brother, which possessed more recognizable brand names. Despite limited success in the ET market, Olivetti decided to enter the PWP market. Their best year in the PWP market was in 1988 when the market was largely undefined and many companies were seeking to establish their products. Olivetti remained in the PWP market until the end, but by 1994 they possessed less than 1% of the market.

⁵¹ "Olivetti to Unveil Two Portable Electronic Typewriters," *Dow Jones News Service*, 31 December 1980.

Olivetti Facts⁵²:

Table 9: Olivetti Facts

Competitor in the ET Market	Yes
Entered ET Market	1979
Largest ET Market Share	1.76% (1992)
Competitor in the PWP Market	Yes
Entered PWP Market	1986
Largest PWP Market Share	9.06% (1988)
Product Focus	mid-range
Target Market	household consumers and home offices

⁵² Market entry dates as well as market shares are approximates.

6.7 Olympia

Olympia was the second European firm to enter the ET market. Their entry in 1979 was only a few months after Olivetti entered. However, Olympia did not achieve as much success as Olivetti. While Olivetti quickly developed a reputation for producing better products than IBM, Olympia seemed content to serve niche markets in the U.S. They specialized in producing basic, low-end units that were among the least expensive models in the market. Thus, Olympia only had a minor presence in both the consumer and office ET segments. Their largest share of the ET market was in 1992 when they possessed approximately 1.25% of the market.

Perhaps the main reason why Olympia remained a low-key competitor in the U.S. ET market was because the firm was consistently strong in the European market. Most likely, Olympia was devoting the majority of its resources toward their European customers and any additional customers in the U.S. were seen as a bonus. However, it appeared that Olympia wanted to make a bigger impact on the PWP market in the U.S. The company spent \$5 million in 1987 to promote their new high-end PWPs, which represented a substantial increase over promotional expenditures for previous years. This increased spending did not improve sales. Perhaps it was due to Olympia's reputation as a low-end, low-cost producer and customers were unsure if Olympia could make a seamless transition to being a high-end manufacturer. In the early 1990s, Olympia exited typewriter markets in the U.S., but they continued to compete in European markets.⁵³

⁵³ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 176-177.

Olympia Facts⁵⁴:

Table 10: Olympia Facts

Competitor in the ET Market	Yes
Entered ET Market	1979
Largest ET Market Share	---
Competitor in the PWP Market	Yes
Entered PWP Market	1987
Largest PWP Market Share	---
Product Focus	basic
Target Market	small firms and households

⁵⁴ Market entry dates as well as market shares are approximates.

6.8 Panasonic

In a sense, the dynamics and happenings of both the ET industry and the PWP industry can be seen by examining Panasonic's operations. Panasonic established itself in the ET market in the early 1980s when the industry was starting to develop. The company enjoyed growth rates that were very comparable with the growth rates of the overall industry. Then, when the ET market began rapidly declining in 1990, Panasonic's performance declined as well. Likewise, in the PWP market, Panasonic was able to increase its market share in the early stages, but when the industry slowed in the mid-1990s, the company's market share evaporated. In both industries, the company was a major competitor among the second-tier typewriter manufacturers. In other words, Panasonic never challenged Smith Corona, Brother, or IBM/Lexmark at the top of the market, but they were able to compete with Sharp, Olivetti, Xerox, and Canon.

In terms of a specific product focus, Panasonic concentrated on the medium to high-end segment of both the PWP and ET markets. Additionally, the company was a presence in both the office and consumer ET markets. In the end, Panasonic was most likely affected by the gradual polarization of the ET industry.⁵⁵ As customers continued to choose either an advanced ET or a basic ET, Panasonic's profits suffered since they produced a lot of mid-range models. Thus, Panasonic pulled out of the consumer ET market in 1991 and tried to transfer their knowledge and expertise toward the PWP industry. However, after only five years in the PWP market, Panasonic held less than 1% of the market, and the company decided to focus on more profitable electronic products such as televisions and cameras.

⁵⁵ "Electronic Typewriters," *Purchasing*, 22 June 1989.

Panasonic Facts⁵⁶:

Table 11: Panasonic Facts

Competitor in the ET Market	Yes
Entered ET Market	1982
Largest ET Market Share	9.83% (1990)
Competitor in the PWP Market	Yes
Entered PWP Market	1986
Largest PWP Market Share	15.76% (1990)
Product Focus	mid-range and high-end
Target Market	small and mid-size firms

⁵⁶ Market entry dates as well as market shares are approximates.

6.9 Sharp

Sharp's initial entry into the ET market in the early 1980s did not go smoothly. Immediately after they introduced their first ET model, Sharp encountered numerous logistical problems that delayed shipments. As a result, dealers and retailers became frustrated with the company. Even after they fixed their shipping issues, retailers and consumers were not very excited about their product offerings. Critics complained that Sharp's ETs did not provide enough features to justify their high prices. Due to these issues, Sharp never became a strong competitor in the ET market. Their best year was in 1990 when they possessed slightly more than 5% of the total ET market.

Schools and governments were the main customers for Sharp's ETs. Given this market segment, Sharp focused their production efforts on basic and mid-range ETs. The basic models were marketed toward schools while the mid-range units were more appropriate for government workers. However, as mentioned earlier, Sharp was never able to become a major presence with their products in the industry. The lack of success in the ET market made it easy for the firm to decide that they would not pursue an entry into the PWP market.⁵⁷ While Sharp developed a few CRT PWPs, they never earned more than 1% of the PWP market. Like similar firms such as Panasonic and Canon, Sharp decided to focus on more profitable electronic products.

⁵⁷ Danzing et al, *The U.S. Market For Consumer and Office Electronic Typewriters into the 1990s: Can it Withstand the Threat of Personal Word Processors and Personal Computers Much Longer?* (Venture Development Corporation Report, 1988), 179-180.

Sharp Facts⁵⁸:**Table 12: Sharp Facts**

Competitor in the ET Market	Yes
Entered ET Market	1983
Largest ET Market Share	5.22% (1990)
Competitor in the PWP Market	No
Entered PWP Market	---
Largest PWP Market Share	---
Product Focus	basic and mid-range
Target Market	schools and governments

⁵⁸ Market entry dates as well as market shares are approximates.

6.10 Smith Corona

Widely regarded as the most prominent typewriter manufacturer, Smith Corona was one of the few firms that achieved considerable profits in both the ET and PWP industries. Regarding the ET industry, Smith Corona's success can be directly attributed to its dominance in the consumer ET market. From the early 1980s to the middle of the 1990s, Smith Corona was the clear leader in this market. The company had a very wide and deep assortment of product offerings. Indeed, Smith Corona satisfied all different types of customers as they produced basic, mid-range and high-end units. In fact, Smith Corona was able to attain overall ET market leadership for many years in the 1980s and 1990s even though they only produced consumer ETs. In other words, Smith Corona only produced consumer ETs, yet they were able to gain more market share than firms that produced both consumer ETs and office ETs.

Smith Corona's success in the consumer ET market allowed the firm to easily apply their competences and expertise to the PWP industry. Thus, Smith Corona got a major head start in the PWP market because they already had a large customer base and a strong brand name. These factors enabled Smith Corona to introduce the first PWP (the PWP 12) as well as claim the top spot in the PWP market until 1991. They were also able to expand their customer base, and therefore continue growing, by targeting college students and retirees. By 1991, they ceded the top position to Brother and would never reclaim the spot.

Two critical reasons explained Smith Corona's downfall. First off, the PWP industry, as well as the general typewriter industry, was being hit hard by the growth and development of the computer industry. As more consumers and businesses switched to

computers, Smith Corona saw profits decline sharply. A second reason was the messy court battle the firm engaged in with Brother. Smith Corona accused Brother of selling their PWP's in foreign countries at suspiciously low prices. Since this dispute with Brother lasted for three years, a considerable amount of Smith Corona's resources were dedicated toward the court battle. Once the case was resolved three years later, Smith Corona appeared to have lost all of its energy. In an attempt to rebound, Smith Corona diversified its product offering to include items such as fax machines and office furniture.⁵⁹ These new products were not warmly received in the marketplace and in the end, the company filed for Chapter 11 bankruptcy protection in 1995. Thus, unlike other firms in the ET and PWP markets, Smith Corona does not still conduct business today.

Smith Corona Facts⁶⁰:

Table 13: Smith Corona Facts

Competitor in the ET Market	Yes
Entered ET Market	1980
Largest ET Market Share	30.63% (1990)
Competitor in the PWP Market	Yes
Entered PWP Market	1984
Largest PWP Market Share	38% (1993)
Product Focus	basic, mid-range and high-end
Target Market	household consumers and home office customers

⁵⁹ "Smith Corona Enters Home Office Furniture Market," *Business Wire*, 21 December 1993.

⁶⁰ Market entry dates as well as market shares are approximates.

6.11 Xerox

Xerox was a rare company in the ET industry because they were able to achieve success quite rapidly. In fact, Xerox entered the ET market in 1982 and by 1984 they shared the top spot in the market with IBM. IBM had been in the market since 1978. Perhaps the main reason for their rapid market ascension was the large amount of resources that came with being a successful corporation. Of their resources, their most powerful one was their experienced copier and duplicator sales force. Xerox used their heralded sales force to promote their ETs and the results were remarkable. Also, Xerox's strong brand name contributed to their success. In many cases, retailers only stocked one or two ET brands in their stores and since Xerox was a well established name, the dealers knew that Xerox products would sell well. Thus, the early stages of the ET industry could be classified as a battle between IBM and Xerox for market leadership.

Since Xerox was competing with IBM, their main focus was on the office ET industry. Even though Xerox was involved with the consumer ET market, their primary products were mid-range and high-end office ET models. Their ETs had more features and functions than IBM's ETs and they were also hundreds of dollars cheaper.⁶¹ However, despite their product superiority, the intense competition of the ET industry prompted Xerox to exit in the early 1990s. It did not make sense to continue dedicating resources to a saturated and dying market. They wanted to focus more attention on their copier and duplicator products as well as explore options in the growing computer industries.⁶² Xerox was a minor presence in the PWP industry as their best year was in

⁶¹ "Xerox unveils Four Models of Electronic Typewriters," *Dow Jones News Service*, 17 November 1981.

⁶² Jonathan Chevreau, "Xerox Makes Plans to Enter Personal Computer Market," *The Globe and Mail*, 13 June 1981.

1988 when they held approximately 8.84% of the market. They exited after 1990.

Today, Xerox continues to offer a wide array of printers, copiers and scanners.

Xerox Facts⁶³:

Table 14: Xerox Facts

Competitor in the ET Market	Yes
Entered ET Market	1982
Largest ET Market Share	30% (1984)
Competitor in the PWP Market	Yes
Entered PWP Market ¹	1985
Largest PWP Market Share	8.84% (1988)
Product Focus	mid-range and high-end
Target Market	small, mid-size and large firms

⁶³ Market entry dates as well as market shares are approximates.

7. The Technological Extinction of the Typewriter Industry

7.1 Three Theories on Market Evolution

In most instances, the evolution of a new manufacturing industry follows a common pattern. Shortly after the industry is formed, the number of competitors increases rapidly over the course of a few years. Then, the industry changes its direction and the number of firms severely declines as certain firms develop the ability to operate more efficiently than others. Over time, a handful of large firms remain in the industry and form a dominant presence. Klepper and Simons label this rapid reduction in participation in an industry as a “shakeout.”⁶⁴ Three theories have been developed to help explain how shakeouts occur: the innovative gamble, dominant design, and the research and development returns model. Even though all three theories differ in regards to the origin of shakeouts, they all cite technological change as the main driver.⁶⁵

The innovative gamble model states that a new industry is created by a basic invention and the shakeout occurs when a refinement is made to the basic invention. The firms that are most effective in developing the refinement force the inefficient firms out. In other words, a large number of firms enter the market after a basic product is introduced, and each firm is gambling that they will be the first to develop a modification to the original product. With the dominant design theory, a new product must conform to a set of accepted standards. Companies that best conform to product standards will naturally drive other firms out of the industry. Finally, the research and development returns model (R&D model) highlights the importance of firm size in determining market

⁶⁴ Steven Klepper and Kenneth L. Simons, “Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes,” *Industrial and Corporate Change* 6 (1997): 379.

⁶⁵ Steven Klepper and Kenneth L. Simons, “Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes,” *Industrial and Corporate Change* 6 (1997): 381.

participation. This theory states that returns from R&D provide major advantages to the earliest entrants as well as the largest entrants. In fact, the returns are so great that entry into the industry becomes unprofitable and the smaller and less capable firms become victims of the shakeout.⁶⁶ The dominant design theory and the R&D model are the two theories which best describe the shakeout of the modern typewriter industry.

7.2 The Shakeout of the Modern Typewriter Industry

The dominant design theory is directly applicable to the ET industry because almost all of the ETs that were produced conformed to similar product standards. Perhaps the most important standard was the use of the daisy wheel printing mechanism. Other than IBM, all of the other major ET firms used the daisy wheel.⁶⁷ Thus, one reason for the erosion of IBM's market share throughout the 1980s was due to their reluctance to conform to accepted product standards. It is not clear why IBM chose to continue using their "golfball" printing device as opposed to the daisy wheel. A possible explanation was that it was too costly to modify the production process at their automated facility in Lexington. Nevertheless, the theory illustrates that companies will suffer if they do not adopt the dominant design. Other standards, such as amount of memory and text formatting capabilities, also made up the dominant design of an ET.

Another important part of the dominant design theory is that after the development of the dominant design, product innovation becomes incremental. Firms in the ET industry relied heavily on incremental product improvements. In fact, both ET and PWP firms struggled to come up with significant innovations. The only major

⁶⁶ Steven Klepper and Kenneth L. Simons, "Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes," *Industrial and Corporate Change* 6 (1997): 382 - 386.

⁶⁷ Franklin Whitehouse, "IBM's Typewriters Miss a Stroke," *The New York Times*, 28 March 1982.

innovation in the modern typewriter industry was the ink-jet printing capabilities that Canon provided with their PWP. As a result, ET and PWP firms had to compete by offering different varieties of the dominant design. For example, some firms, such as Lexmark, concentrated on producing typewriters with as much memory as possible and other firms, such as Olivetti, focused on providing advanced formatting functions.⁶⁸

Finally, the dominant design theory states that firms that enter the market after the dominant design is developed have a difficult time succeeding in the market.⁶⁹ This is because the incumbent firms already have an established customer base as well as benefits that come from economies of scale. Many of the larger firms trying to make an entry in the ET industry, such as Panasonic and Sharp, found it very difficult to divert customers away from Smith Corona and Brother once the dominant design was developed. Also, the dominant design theory was modified by Christensen to include the fact that the firms that entered toward the latter stages of the pre-dominant design period would be the most successful.⁶⁹ Again, the ET industry serves as a perfect example of this assertion. The latest entrants among the pre-dominant design firms were Smith Corona and Brother while the earliest entrants for this period were IBM and Olympia. Christensen argues that the earlier entrants would still have resources tied up in older technologies that would be obsolete after the dominant design. During the 1980s, IBM still dedicated considerable resources toward its Selectric line of electromechanical

⁶⁸ Nancy Cosgrove, "Typewriters Adapt: They're Here to Stay," *The Office* 117 (1993): 88 – 89.

⁶⁹ Steven Klepper and Kenneth L. Simons, "Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes," *Industrial and Corporate Change* 6 (1997): 384.

typewriters.⁷⁰ As a result, they continued to lose market share to Brother and Smith Corona.

The R&D returns model provides more insight to help explain why Brother and Smith Corona were the two most successful firms in the modern typewriter industry. While this model distinguishes between process R&D and product R&D, process R&D was far more important to the typewriter industry. According to the model, process R&D reduces a firm's average cost of production, and since average cost is proportional to output, larger firms earn a greater return from R&D. The larger return leads to faster growth as well as gradual price reductions. Lower prices drive the inefficient firms out of the market and they also limit entry because new firms are not able to produce products as cheaply as the incumbents.⁷¹

Both Smith Corona and Brother were more dedicated than their competitors regarding process and product R&D. In the mid 1980s, Smith Corona changed its entire production process and was able to reap the benefits of a more cost-efficient assembly line.⁷² Smith Corona was also one of the first companies to introduce typewriters that could erase words and perform spell checks. As further proof of Smith Corona's successful R&D improvements, in 1989 the company said that 40% of their sales were to first-time buyers. Five years earlier, only 20% of sales went to first-time buyers and 80% of its sales went to replacement buyers.⁷³ Thus, in addition to having a large customer

⁷⁰ Dennis Kneale, "IBM Says Demand and Shipments of PC are Exceeding Company Expectations," *The Wall Street Journal*, 16 March 1984.

⁷¹ Steven Klepper and Kenneth L. Simons, "Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes," *Industrial and Corporate Change* 6 (1997): 386.

⁷² "Smith-Corona's Success Story," *Chicago Sun-Times*, 5 July 1986.

⁷³ Manning Greenberg, "Smith Corona's Market Share is Growing: Constant Product Innovation has Provided Edge Against Foreign Competitors," *The Weekly Home Furnishings Newspaper*, 5 March 1990.

base, Smith Corona was able to lure customers away from other firms. The firms that lost customers to Smith Corona were driven out of the industry.

While Smith Corona concentrated on adding incremental features to its products, Brother successfully used its process R&D to produce smaller, more efficient designs for their existing products. Better designs enabled Brother to expand into new markets in the Far East and Latin America where cost and size were more important than advanced features. Also, Brother was the first company to develop a Japanese language word processor and among the first firms to develop Spanish and Portuguese versions.⁷⁴ The overall lack of innovation in the typewriter industry also aided Brother and Smith Corona. As mentioned earlier, the only major innovation was developed by Canon in the early 1990s. Not coincidentally, Canon's innovation enabled the company to acquire more than 17% of the PWP market after only four years in the industry. Since none of the other firms were innovative, customers for both Smith Corona and Brother had no reason to switch to a competitor.

A final aspect regarding the shakeout of the typewriter industry that is captured by the R&D returns model is the fact that the number of firms in the industry declines sharply after the shakeout occurs. With both the ET and PWP industries, the number of firms competing in the industry continued to drop after the shakeout. The dominant design theory says that the industry tends to stabilize after the inefficient firms have exited. Thus, for the modern typewriter industry, the period after the shakeout is best represented by the decline in participation provided in the R&D returns model. Also, the R&D returns model is the only theory which states that the largest firms that survive will

⁷⁴ "Brother Maps Strategy as Typewriter Sales Dip," *The Commercial Appeal Memphis, TN*, 17 September 1995.

account for a disproportionate amount of the process R&D.⁷⁵ Brother and Smith Corona confirmed this assertion.

Even though Smith Corona was one of the two firms that survived the longest in the typewriter industry, the company is no longer in business. While the rise of computer systems and their court battle with Brother were major contributors to the demise of the company, their downfall was also a result of their single product focus. It is important to recall that, among the final survivors of the typewriter industry, Smith Corona was the only company that focused mainly on manufacturing typewriters. Canon still had its successful camera business and Brother was a main competitor in the sewing machine market. Therefore, whenever Smith Corona came up with a refined typewriter model, they needed to release the model as soon as possible. They would allocate necessary resources to modify their production line so that large volumes could be produced. However, toward the latter stages of the PWP industry, it appeared that Canon simply waited until Smith Corona came up with a typewriter with new features and then copied the design. With its overseas production centers, Canon could manufacture a typewriter with the new innovation at a lower cost and also sell the product at a cheaper price. Then, Smith Corona would be left with a large inventory of typewriters that they had to sell at lower prices. Over time, Smith Corona would not be able to generate enough profit from their innovations to continue operating.

⁷⁵ Steven Klepper and Kenneth L. Simons, "Technological Extinction of Industrial Firms: An Inquiry into their Nature and Causes," *Industrial and Corporate Change* 6 (1997): 386 - 387.

7.3 Conclusion

In the end, the lack of innovation was the main reason for the extinction of the modern typewriter industry. In their examinations of the automobile, tire, and radio industries, Klepper and Simons provided numerous tables of process and product R&D improvements that helped explain the evolution of each industry. In comparison, there was only one major innovation in the typewriter industry, and this innovation was in the latter stages of the industry. Since firms did not need to succeed based on innovative products, the three major determinants of success were: market entry date, firm size, and conformation to product standards.

Since Smith Corona and Brother satisfied all three of these characteristics, they were the most successful. Both companies entered the ET market before 1982 and were also among the first entrants in the PWP market. They were relatively large companies that benefited from the returns and cost reductions that were the result of process and product R&D as well as economies of scale. IBM, on the other hand, only met two of the three requirements for success. In the beginning, IBM benefited tremendously from their strong brand name and existing customer base. As mentioned earlier, IBM's reputation was strong enough to overcome its weak product offerings. Over time, IBM's reluctance to conform to accepted standards eventually drove their loyal customers to Smith Corona and Brother. However, it is also important to recall that IBM was more interested in computers and software, so the company did not want to continue pouring money into its declining typewriter business. Finally, firms that entered the market too late (such as Panasonic and Sharp) or firms that were not of sufficient size (such as Swintec and Olivetti) were eventually forced out of the market.

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