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Apple Computer 2002

Observing Apple Computer in the 1990s was like watching a melodrama unfold. In five years, Apple had four CEOs (John Sculley, Mike Spindler, Gil Amelio, and Steve Jobs). As each new chief executive took control, the company went through one reorganization after another. By July 1997, Apple had surrendered two-thirds of its market share, losses topped \$1.6 billion, and shares were trading near all-time lows. (See Exhibit 1.) Competitor Michael Dell recommended that Apple throw in the towel: "I'd shut it down and give the money back to the shareholders."¹ But as Apple entered the new millennium, many loyalists hoped that the melodrama was over. Co-founder Steve Jobs had come to Apple's rescue when the company was at its lowest point. Jobs unleashed a series of dramatic moves, including a stunning decision to sign a long-term cross-licensing agreement with Microsoft for \$150 million.² Jobs then ended Spindler's cloning strategy and went on to kill the Newton, John Sculley's pride and joy. But Jobs's boldest gambit was the iMac, a cleverly designed, low-cost Macintosh that took the market by storm in 1998. Four years later, an updated and more powerful iMac was introduced as a "digital hub" for Apple's new peripheral devices and software. Jobs also broke tradition by opening dozens of Apple-exclusive retail stores and by outsourcing iMac production. By 2000, Jobs had reversed course on nearly every aspect of his predecessors' strategies and had returned the company to profitability. In 2002, however, Apple again faced weak unit sales, flat gross margins, and declining share in several core markets. Steve Jobs had to wonder: was this *déjà vu* for Apple, or would the new products and strategy bring the company back to life?

Apple's History

The Early Years

Steve Jobs and Steve Wozniak, a pair of 20-something college dropouts, founded Apple Computer on April Fool's Day 1976.³ Working out of the Jobs family garage in Los Altos, California, they built a computer circuit board they named the Apple I. Within several months, they had made 200 sales and taken on a new partner: A.C. "Mike" Markkula, Jr., a freshly minted millionaire who had retired from Intel at the age of 33. Markkula, who was instrumental in attracting venture capital, was the experienced businessman on the team; Wozniak was the technical genius; and Jobs was the visionary who sought "to change the world through technology."

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Jobs made it Apple's mission to bring an easy-to-use computer to every man, woman, and child. In April 1978, the company launched the Apple II, a relatively simple machine that ordinary people could use straight out of the box. The Apple II set off a computing revolution that drove the personal computer (PC) industry to \$1 billion in annual sales in less than three years.⁴ Apple quickly became the industry leader, selling more than 100,000 Apple IIs by the end of 1980. (See Exhibit 2.) In December 1980, Apple launched a successful IPO. (See Exhibit 3.)

Apple's competitive position changed fundamentally when IBM entered the PC market in 1981. The IBM PC, which relied on Microsoft's DOS operating system and a microprocessor from Intel, was stolid and gray when compared to the graphics- and sound-enhanced Apple II. But the IBM PC was a relatively "open" system that other manufacturers could clone. By contrast, Apple's computers relied on proprietary designs that only Apple could produce. As IBM-compatibles proliferated, Apple's revenues continued to grow, but its market share dropped sharply, falling to 6.2% in 1982.⁵

Apple's first response to the IBM-compatible onslaught was the Lisa, a stunning next-generation machine. The Lisa, which Jobs named after his daughter, was the first personal computer to use a graphical user interface (GUI) and a point-and-click mouse. The Lisa also featured a windowing system that allowed several applications to run at the same time. However, it was incompatible with the IBM standard and even with the Apple II. Priced at \$10,000, the Lisa found few buyers, and Apple dropped it soon after its launch in 1983. Instead, the company focused on developing a cheaper machine with many of the same advanced features. Steve Jobs personally oversaw the project, pampering his troops with fresh-squeezed orange juice while exhorting them to create something "insanely great." The result was the Macintosh, introduced in early 1984.

The Mac marked a breakthrough in ease of use, industrial design, and technical elegance, but its slow performance and the lack of Mac-compatible software limited sales. Between 1983 and 1984, Apple's net income fell 17%, leaving the company in crisis. In April 1985, Apple's board removed Jobs from an operational role. Several months later, Jobs left Apple to found a new company named NeXT. These moves left John Sculley, the CEO who had been recruited from Pepsi-Cola in 1983, alone at the helm. Armed with a Wharton MBA, Sculley had led Pepsi's charge against Coke. Now he hoped to use his marketing savvy and operational expertise to drive Apple to similar heights.

The Sculley Years, 1985-93

Sculley sought to exploit Apple's capabilities in graphics and design to make the company a leader in desktop publishing as well as education. He also moved aggressively to bring Apple into the corporate world. Apple's combination of superior software, like Aldus (later Adobe) PageMaker and Microsoft Excel, and peripherals, such as laser printers, gave the Macintosh unmatched capabilities in desktop publishing. Sales exploded, turning Apple into a global brand. By 1990, revenues reached \$5.6 billion, while Apple's worldwide market share stabilized around 8%. In the education market, which contributed roughly half of Apple's U.S. revenue, the company's share was more than 50%. Apple had \$1 billion in cash and was the most profitable personal computer company in the world.

Apple's position in 1990 Apple controlled the only significant hardware and software alternative to the IBM standard. The company practiced horizontal and vertical integration to a greater extent than any other PC company, with the exception of IBM. Apple typically designed its products from scratch, specifying unique chips, disk drives, monitors, and even unusual shapes for its computers' chassis. While it never backward integrated into microprocessors—which were supplied exclusively by Motorola—the company manufactured and assembled most of its own products in state-of-the-art factories in California. Apple also developed its own proprietary

operating system (OS), which was bundled with the Mac; Mac applications software (through its subsidiary, Claris); and many peripherals, such as printers.

Analysts generally considered Apple's products to be more versatile than comparable IBM-compatible machines. In 1990, IBM-compatibles narrowed the gap in ease of use when Microsoft released Windows 3.0. But in many core software technologies, such as multimedia, Apple retained a big lead. In addition, since Apple controlled all aspects of the computer, it could offer customers a complete desktop solution, including hardware, software, and peripherals that allowed customers to "plug and play." Adding extra hardware and software to a Mac was almost as easy as plugging speakers into a stereo system. By contrast, users often struggled to add hardware or software to IBM-compatible PCs. This led one analyst to comment, "The majority of IBM and compatible users 'put up' with their machines, but Apple's customers 'love' their Macs."⁶

This love affair with the Mac allowed Apple to sell its products at a premium price. Top-of-the-line Macs went for as much as \$10,000, and gross profit hovered around an enviable 50%. However, senior executives at Apple realized that trouble was brewing. As IBM-compatible prices dropped, Macs looked increasingly overpriced. As John Sculley explained, "We were increasingly viewed as the 'BMW' of the computer industry. Our portfolio of Macintoshes were almost exclusively high-end, premium-priced computers...Without lower prices, we would be stuck selling to our installed base." Moreover, Apple's cost structure was high: Apple devoted 9% of sales to research and development (R&D), compared to 5% at Compaq, and only 1% for many IBM-clone manufacturers. These concerns led Dan Eilers, then vice president of strategic planning at Apple to conclude: "The company was on a glide path to history."

Sculley believed "drastic action" was necessary in order to get Apple back on track. In his words, there would be no "sacred cows": "We still want to change the world, but we have to transform the company and industry for it to work."

Macs Beginning in 1990, Sculley moved to reposition Apple into the mainstream "with products and prices designed to regain market share." This meant becoming a low cost producer of computers with mass-market appeal. He also sought to maintain Apple's technological lead by bringing out "hit products" every six to 12 months. In October 1990, Apple shipped the Mac Classic, a \$999 computer intended to compete head-to-head with low-priced IBM clones. One year later, Apple launched the Powerbook notebook computer to rave reviews.

Despite these signs of strength, Sculley believed that Apple had to form a "federation" of corporate alliances in order to penetrate a broader market. In 1991, he led Apple into a close relationship with its foremost rival, IBM. This alliance had three major strands. First, Apple and IBM formed a joint venture, named Taligent, which was intended to create a revolutionary operating system incorporating the latest advances in software technology. At the time, it cost around \$500 million to develop a next-generation OS; subsequently, marginal costs were close to zero. Second, Apple committed to switch from Motorola's microprocessors to IBM's new PowerPC chip, while IBM agreed to license its technology to Motorola, in order to guarantee Apple a second source. Sculley believed that the PowerPC could help Apple to leapfrog Intel. Third, Apple and IBM formed another joint venture, named Kaleida, to create a common language for multimedia applications. One of Kaleida's projects was to write software for set-top boxes for interactive TV.

Apple's alliance with IBM was announced in a blaze of publicity in October 1991. By contrast, a second cooperative effort, involving Intel and Novell, was kept strictly under wraps. In early 1992, Sculley authorized a secret effort, codenamed "Star Trek," to rework the Mac OS to run on Intel chips. By November, Apple had a working prototype of the Mac OS on an Intel-based PC.

Other products Although Sculley was a marketer by training, he took the post of chief technology officer (CTO) in March 1990. Sculley believed strongly that Apple had to change the rules of the game to thrive in the coming decade. In his new role as CTO, Sculley championed the Newton, the first new product in a category he called "personal digital assistants" (PDAs). Sculley believed that Apple's expertise in user-friendly software would give it an edge as computers and consumer electronics converged.

Internal changes Sculley argued that it was essential for Apple to drive down costs in order to be competitive in the marketplace. In 1991, as pricing pressure hit Apple, the company moved to reduce its headcount by 10%. Apple also sought to move much of its manufacturing to subcontractors and adopted a tougher line toward distribution and development partners. However, these actions were not enough to sustain Apple's profitability. With gross margin headed toward 34%, 14 points below Apple's 10-year average, and Sculley's decision to commute from Connecticut to the West Coast, the board "promoted" Sculley to chairman in June 1993 and appointed Michael Spindler, the company president, as the new CEO. Five months later, Sculley resigned to become the CEO of Spectrum Technologies, a small telecommunications firm in Connecticut. After three months, claiming he had been misled, Sculley left Spectrum amid an SEC investigation. He later joined his two brothers to establish a venture capital firm based in New York City.

The Spindler Years, 1993-95

Spindler was a German-born engineer who came to know Mike Markkula while working at Intel. As the head of Apple Europe, he tripled his division's revenues between 1988 and 1990, eventually accounting for 25% of Apple's sales worldwide.⁸ Internally, people viewed Spindler as a strong operating manager, whose no-nonsense style contrasted sharply with Sculley's high-level focus on marketing and technology strategies. In one of his first public moves as CEO, Spindler declared that he would never allow Apple's products to be competitively overpriced again. In addition, Spindler tried to refocus the company on its core markets: the kindergarten-through-high-school and desktop publishing segments, where Apple held 60% and 80% share respectively.⁹

Macs By 1994, it was estimated that Apple had sold 25 million computers worldwide. (See Exhibit 4.) Over the years, groups within Apple had considered a number of plans to broaden the Mac platform's reach. These included putting the Mac interface on top of Microsoft's DOS operating system; "porting," or rewriting, the Mac OS to run on Intel chips (Star Trek); and allowing other companies to manufacture Mac clones. In January 1994, after years of intense internal debates, Spindler killed the plan to put the Mac OS on PCs and announced that Apple would license a handful of companies to make Mac clones. The average price for a Mac OS license was roughly \$50 per copy.

At the same time, Apple continued its efforts to stay one step ahead of the IBM-compatible world. In March 1994, Apple tried to reestablish itself as a technology leader with the launch of the PowerMac. Apple's newest computer was based on the PowerPC microprocessor, which improved performance two- to eight-fold over the previous generation of Macs. In the first few months, PowerPC chips also had a significant price/performance advantage over Intel microprocessors. However, the PowerPC's advantages turned out to be fleeting, and by late 1994, Macs were selling for a premium of almost \$1,000 over comparable Intel-based machines. In the summer of 1995, Apple cut prices by 25%, and unit sales surged. By the fall, Apple had briefly regained its position as the leading seller of PCs in the United States. But Apple was clearly losing momentum: a 1995 *Computerworld* survey of 140 corporate computer system managers found that none of the Windows users would consider buying a Macintosh, but more than half the Apple users expected to buy an Intel-based PC.¹⁰

Spindler, like Sculley, had hoped that a revolutionary new operating system would turn the picture around, but the prospects for a breakthrough were fading fast. At the end of 1995, Apple and IBM parted ways on Taligent and Kaleida. After spending \$550 million to \$600 million, neither side wanted to switch to the new technology.¹¹ IBM remained committed to UNIX, OS/2, and Windows as its core operating systems, while Apple continued to focus on improving the Mac OS.

International expansion Spindler set international growth as a key objective for Apple. In 1992, 45% of the company's sales came from outside the United States. One of the markets where Apple had enjoyed particular success was Japan, where the coexistence of multiple proprietary standards kept PC prices significantly higher than in the rest of the world. In 1993, Apple held 14% of the Japanese market, second only to NEC.¹² However, Fujitsu launched a ferocious price war in 1995. Although Apple cut prices, its market share began to erode, and gross margins collapsed. Within one year, Japan went from Apple's most profitable to one of its least profitable divisions.

Spindler also targeted China, one of the fastest-growing computer markets. Spindler set an ambitious goal: 15% to 16% market share in China by the year 2000.¹³ In 1992, Chinese consumers bought only 190,000 PCs: 93% were Intel-based machines, and 2% came from Apple. However, analysts predicted that China would purchase 50 million personal computers annually by 2010, making it one of the largest markets in the world. In addition, Apple's software was widely believed to offer the best solution for handling Chinese characters.

Internal changes Spindler moved quickly to cut costs, announcing within weeks of his appointment that Apple would lay off 2,500 employees, or 16% of its workforce worldwide. At the same time, Apple reduced spending on R&D to 6% of sales. Spindler improved efficiency and cut development cycles from 24 months to nine, but serious operational problems remained. Poor forecasting and a dearth of key parts left Apple unable to meet demand for its best-selling products, while older lines languished on the shelf. In mid-January 1996, Apple reported a \$69 million loss for the latest quarter and announced that 1,300 workers would be laid off.¹⁴ Two weeks later, Gilbert Amelio, an Apple director, replaced Spindler as CEO.

The Amelio Years, 1996-97

Amelio, like Spindler, came from an engineering background. After turning around Rockwell International's semiconductor business, he was hired to do the same at National Semiconductor. Apple's board of directors enticed Amelio with a very lucrative golden parachute, hoping that he could repeat his magic one more time. When Amelio arrived, the company was in a desperate state. The stock price was at its lowest point in more than a decade. Amelio immediately set out to improve operations by streamlining Apple's product line, slashing the payroll, and rebuilding cash reserves. He also planned to push Apple into higher-margin segments, such as servers, Internet access devices, and PDAs. Four months after Amelio arrived, he proclaimed that Apple would return to its historical premium-priced differentiation strategy. He declared that just as MagLite could sell its flashlights for huge premiums over ordinary flashlights, Apple should be able to sell Macintoshes at a huge premium over Intel-based PCs.¹⁵

Macs Amelio's efforts to reposition Apple as a premium brand were hampered by growing concerns about quality, support, and software availability. In particular, Apple had difficulty recovering from a 1995 setback, when two PowerBooks caught on fire, pushing the Macintosh image to an all-time low. Apple's worldwide market share dropped from 6% to 3% on Amelio's watch.¹⁶ In the core education market, the company's market share fell from 41% to 27%.¹⁷ Apple executives continued to hope that a brand-new operating system would restore the platform's technological lead. But these efforts were in disarray. Amelio decided to cut Apple's losses by canceling the

repeatedly delayed next-generation Mac OS, which had already cost more than \$500 million in R&D. Instead, in December 1996, he announced that Apple would acquire NeXT Software and that NeXT's founder, Steve Jobs, would return to Apple as a part-time adviser. NeXT's OS, NeXTStep, had a lead in a few technical areas over Microsoft. However, its market share was tiny, and it could not run Mac software. Amelio believed that Apple would need 12 to 18 months to build a new version of NeXTStep designed for top-of-the-line Macintoshes and network servers.

Other products Apple's efforts in other markets were also faltering. By mid-1997, Newton had only 6% of the handheld market, which was dominated by 3Com's PalmPilot (66%) and products based on Microsoft's Windows CE (20%).¹⁸ In addition, Apple was developing set-top box technology for the next generation of TVs, which fared even worse. In December 1996, Apple and its Japanese partner introduced the Pippin, a \$500 device that allowed users to play games, send e-mail, and surf the Web on a TV. The Pippin faced stiff competition and reportedly sold only 12,000 units in the United States before the project was abandoned in early 1998.¹⁹

Internal changes Amelio hired an entirely new senior staff and led the company through three reorganizations. He cut 2,800 workers from the payroll, beginning in April 1996, and in March 1997, Apple announced that another 4,100 would go.²⁰ Yet despite these austerity moves, Apple lost \$1.6 billion from January 1996 through June 1997, and the company's share price sank to a 12-year low. The board forced Amelio out, and Steve Jobs—the mastermind of the Apple I, the Apple II, and the Macintosh—moved back into the executive suite after 12 years in exile. Jobs immediately recruited a new board of directors, including his personal friend Larry Ellison, the CEO of Oracle, and Jerry York, the former CFO of IBM.²¹ In September, Jobs, who also remained head of Pixar Animation Studios, the maker of *Toy Story* and *A Bug's Life*, became Apple's interim CEO.

For Apple to survive into the next millennium, Jobs knew that he would have to take a new approach. Jobs's first task was to figure out a strategy that would reposition Apple in the evolving personal computer industry. The PC industry had changed dramatically since Jobs left Apple in 1985. All of the old formulas followed by his predecessors had underestimated the intensity and rapidity of change in the industry. Jobs was not going to make the same mistakes!

The Evolving Personal Computer Industry

In 2002, personal computers was a \$220-billion global industry. From its earliest days in the mid-1970s, the industry had experienced explosive growth, dramatically altering the landscape of competition. Apple pioneered the first usable "personal" computing devices, but IBM was the company that brought PCs into the mainstream. IBM's brand name and product quality helped it to capture the lion's share of the market in the early 1980s, including almost 70% of the *Fortune* 1000. At the time, many customers shunned IBM-compatible clones due to fears about quality, compatibility, reliability, and service.

IBM's dominance of the PC industry started to erode in the late 1980s, as buyers increasingly viewed PCs as commodities. IBM tried to boost its margins by building a more proprietary PC, but instead, it lost more than half of its market share, as well as its claim to be the standard bearer for the industry. By the early 1990s, "Wintel" (Microsoft Windows and Intel microprocessors) had replaced "IBM-compatible" as the dominant standard. Throughout the 1990s, thousands of manufacturers, ranging from Compaq and Dell to no-name cloners, built personal computers around standard building blocks from Microsoft and Intel. By 2002, there were over 400 million PCs installed around the world. The United States remained the largest market, accounting for approximately 40% of total shipments, followed by Western Europe (25%), Asia/Pacific (including Japan) (25%), and the "rest of

the world" (Latin America, Eastern Europe, the Middle East, Africa, and Canada) (10%).²² Annual PC unit growth averaged roughly 15% since the mid-1980s. Although unit sales were flat in 2001, making it worst year in history for the industry, analysts predicted growth to pick up again through 2005, with the largest increases occurring emerging markets, especially in Asia. Revenue growth, however, was unlikely to keep pace with unit shipments. (See Exhibit 5.) In more mature markets, such as the United States, where 50% of households owned PCs, slowing growth was intensifying competition on price. Sub-\$600 PCs (which usually sold without a monitor) accounted for almost 20% of U.S. retail sales.²³

PC Manufacturing

The PC was a relatively simple device. Using a screwdriver, a person with relatively little technological sophistication could assemble a PC from four, widely available types of components: a microprocessor (the brains of the PC), a motherboard (the main circuit board), memory storage, and peripherals (the monitor, keyboard, mouse, etc.). Most manufacturers also bundled their PCs with an operating system. While the first PC was a desktop machine, by the late 1990s there was a wide range of form factors, including laptops, notebooks, sub-notebooks, workstations (more powerful desktops), and servers (computers that acted as the backbone for networks of PCs).

Using off-the-shelf components in 2002, it cost roughly \$730 to produce a mass market desktop computer that would retail for \$860. The single largest element of cost was the microprocessor, which ranged in price from \$50 to over \$500 for the latest Pentium-class chip. The other main components of the box—the motherboard, hard drive, memory, chassis, power, and packaging—cost around \$250 to \$350. The keyboard, mouse, modem, CD-ROM and floppy drives, and speakers totaled \$90 to \$140; a basic monitor cost around \$100; and Windows 98 and labor added \$45 and \$35, respectively. A manufacturer could push its retail price down toward \$499 by using a less powerful microprocessor, cutting back on hard drive capacity and memory, and offering lower-quality peripherals. Or it could build a machine that would sell for \$2,499 by incorporating the latest microprocessor, a larger hard drive, more memory, a DVD drive, a high-quality monitor, and additional software, such as Microsoft's Office productivity suite.

As components became increasingly standardized, PC makers cut R&D spending. In the early 1980s, the leading manufacturers spent an average of 5% of sales on R&D. In 2001, the average was down to 1.5% to 2%. Rather than invest heavily in R&D, more and more PC companies looked to innovations in manufacturing, distribution, and marketing to give them a competitive edge. Many firms, for example, turned to contract manufacturers to produce both components and entire PCs. Contractors initially shaved costs by handling simple manufacturing operations at flexible, high-volume plants in low-cost locations. Over time, these contractors moved into more complex areas, such as design, prototyping, and testing.

In the late 1990s, a new breed of large, vertically integrated systems contract manufacturer began to build everything for the brand-name companies. These firms were based mainly in China and Taiwan where labor rates were 10% to 20% of U.S. rates. Companies such as Foxconn Electronics, Mitec, FIC, and Lite-On Electronics were designing and assembling basic computers in Asia, and then finish production in geographic hubs, e.g., Mexico or southern California to serve the Americas. CPUs were installed close the market and immediately before shipment to insure the lowest possible price. In addition, many PC manufacturers sought to streamline their operations by moving from a build-to-stock model to a build-to-order or configure-to-order approach. If a company built to stock, it would forecast sales, purchase components, build computers to pre-established specifications, and accumulate inventory in advance of sales. In the build-to-order model, the manufacturer began building a PC only after an order had been received, relying on just-in-time delivery of parts by

suppliers located near the PC assembly plant. In the configure-to-order case, which was also known as channel assembly, the manufacturer shipped a PC chassis, complete with motherboard and power supply, to a distributor. The distributor then relied on a small inventory of components to configure PCs to customer specifications as orders arrived.

By moving from build-to-stock to build-to-order, a company could potentially reduce its costs by 10%.²⁴ Roughly half of these savings came from cuts in inventory carrying costs and product returns. The remaining savings were due to a decline in price protection costs. Manufacturers incurred price protection costs by guaranteeing distributors against revenue losses resulting from future price cuts. By the late 1990s, these costs were climbing as the prices of key components—including microprocessors, memory, and hard disk drives—plunged. It was estimated that average component cost reductions reached 1% per week in the spring of 1998, twice the industry's historical average.²⁵ By 2002, component costs were declining roughly 6% per quarter while average retail PC prices dropped from 4% to 9% per year.²⁶

Buyers and Distribution

PC buyers fell into four broad categories: business, government, education, and home. Worldwide, home PCs accounted for 40%, education owned 6%, and business and government comprised the remaining 54% of the installed base of 400 million PCs.²⁷ In 2001, business—small and large—in the U.S. bought roughly 60% of all PCs; government and education bought 8% each; and the home market made up the rest.²⁸ The major criteria guiding PC purchases tended to vary by market segment. While price was critical to all segments, home users were generally the most sensitive to cost, while business customers, especially the small-office, home-office (SOHO) users, made decisions based on the combination of service and price. Education buyers focused on a combination of price and the availability of appropriate software.

In the 1980s, most PC buyers were business managers that were relatively unsophisticated first-time customers. Since most IT organizations wanted to avoid buying PCs, managers in corporate departments generally made their own decisions. Yet many were intimidated by the technology and placed great emphasis on service, support, and compatibility in their buying decisions. In general, they bought no more than a few PCs at a time and preferred to buy established brands through full-service computer dealers. In the early 1990s, however, as customers became more knowledgeable about PCs, a variety of alternative channels emerged. Corporate information technology managers and purchasing departments, often operating under tight budgets, began to buy large numbers of PCs directly from manufacturers or their distributors. Superstores, such as Staples, Wal-Mart, and Costco, catered to the consumer and SOHO markets. Mail order outlets, which offered computers and peripherals at 30% to 50% discounts, also saw a sharp increase in demand. In addition, value-added resellers (VARs) emerged to fulfill the growing business demand for networked PCs. VARs purchased PCs from a manufacturer or distributor and configured them with hardware and software to meet specific customers' needs. VARs were particularly important in the small business market, which accounted for nearly one-quarter of PC shipments in the United States.²⁹

In the late 1990s, fueled by the explosion of the Internet, a growing number of manufacturers began to market PCs directly to customers over the World Wide Web. By 2001 in the United States, roughly 40% of PCs were distributed through direct channels. Commercial channels, which included corporate account resellers, independent VARs, systems integrators, and computer specialty dealers, accounted for 25% of sales, as did retail channels such as Circuit City and CompUSA. Third-party Internet telesales accounted for the remainder.³⁰ Each channel appealed to a different mix of buyers. Retail customers, for example, were more likely to be first-time buyers, while customers in direct channels tended to be "power users" looking for sophisticated PCs.

PC Manufacturers

The four top vendors—Dell, Compaq, Hewlett-Packard, and IBM—accounted for 40% of PC shipments in 2001.³¹ (See Exhibit 6.) Dell, a direct-sales pioneer, grew explosively in the late 1990s to claim worldwide market leader position in 2001; in 2002, it was the fastest growing and most profitable of the top four vendors in the PC business. Compaq boasted a full range of PCs, from sub-\$1,000 desktops to servers selling for tens of thousands of dollars. Hewlett-Packard maintained a relatively small portion of its portfolio in PC sales. Meanwhile, IBM, which once held 30% of the market, was restructuring dramatically to staunch the deterioration of its market share and profitability. Below this top tier were a number of well-known brands, including Acer, Fujitsu, Gateway, NEC, and Toshiba. In addition, “white boxes”—PCs without national brands, assembled primarily by small resellers and specialty retailers—accounted for 23% of the market in North America, 50% in Europe and Asia, and over two-thirds in China.³² From Steve Jobs’s perspective, however, the main challengers remained Dell, Compaq, Hewlett-Packard, and IBM. (See Exhibit 7.)

Dell Michael Dell started selling computers out of his dorm room at the University of Texas-Austin in 1984. Dell Computer’s first product was an IBM PC clone, which sold through computer magazines for 50% off IBM’s price. By 2002, Dell offered a full line of desktops, notebooks, workstations, and servers, in addition to software, service, and support. The company had \$31.9 billion in sales, approximately half of which was generated by its Web site. Dell executives attributed their success to the company’s distinctive business model, which centered on direct sales and build-to-order manufacturing. Dell only needed 36 hours after taking an order to ship a computer out the door. Consequently, in 2001, Dell maintained 6 days of inventory, compared to Compaq’s 26. Cost savings such as these allowed the company to maintain high margins while undercutting rivals’ prices by 10% to 15%.³³ Moreover, the Dell model made it possible to offer products that precisely matched customer needs. Customers could use Dell’s Web site to design the exact configuration of hardware and software that they required and find out immediately how much it would cost.

Compaq Founded in 1982, Compaq was one of the earliest and most successful companies to sell IBM-compatible clones. In 1983, Compaq generated more than \$100 million in revenue, setting a U.S. record for first-year sales. Seventeen years later, revenues soared to \$42 billion, making Compaq, which had recently acquired Tandem Computers and Digital Equipment Corporation, the second-largest computer company in the world. Compaq’s original strategy was to sell PCs that offered more power or features at prices close to IBM’s. In 1986, it even scooped IBM by introducing the first PC to use Intel’s powerful new 80386 chip. At the beginning of the 1990s, Compaq stumbled, as younger, more aggressive rivals moved in with cheaper PCs and direct service and support—all of which Compaq lacked. However, the company recovered by slashing costs, especially in engineering, and bringing out a new line of lower-priced machines as well as high-end servers. In the late 1990s, in response to renewed pressure from direct sellers, Compaq again reexamined its approach to building and selling PCs. The result was a hybrid model, incorporating aspects of the direct sellers’ approach. Compaq began to implement build-to-order and configure-to-order programs in order to streamline production. At the same time, the company, which had historically relied on a vast distribution network, moved into direct sales in 1998. In late 2001, Compaq claimed that 59% of the company’s U.S. sales were made online or by phone.³⁴ Despite lowering its distribution costs, Compaq was struggling financially. As it lost share to Dell, Compaq offered to sell the firm to Hewlett-Packard.

Hewlett-Packard (HP) Hewlett-Packard was founded in 1939 by former Stanford classmates Bill Hewlett and Dave Packard. In the 1980s, the firm added computers and printers to its portfolio of electronic instruments and medical equipment. In 2001, HP derived 43% of its sales from imaging and printing and only 20% of its revenue from PCs (compared to Compaq’s 44%). HP claimed nearly

\$2 billion in online sales from 5% of its customers.³⁵ In the late 1990s, HP began to move away from its proprietary software and towards open architecture and Wintel. In addition, in part due to unattractive PC economics, the firm moved into the highly fragmented IT services business with predominantly slower-growth, lower-margin support. In 2002, CEO Carly Fiorina was spearheading HP's planned purchase of Compaq despite the opposition from the children of Hewlett and Packard.

IBM With 2001 sales of \$86 billion, IBM was the largest computer company in the world. Hardware sales generated 43% of revenue, services accounted for 38%, software contributed 14%, and maintenance, rentals and financing made up the rest. Historically, IBM's trademark had been its sweeping horizontal and vertical integration. This strategy had driven IBM to a dominant position in mainframe computers. However, the company failed to secure ownership of the PC platform, instead allowing Microsoft and Intel to seize control of two critical components—the OS and the microprocessor. In the mid-1980s, IBM earned 25% to 30% of the revenues generated by the PC business worldwide.³⁶ But as competitors turned out cheaper and, in some cases, superior products, IBM's market share began to decline. In 1994, IBM's PC business lost \$1 billion and forfeited the number one spot in worldwide PC shipments for the first time.³⁷ The company responded by streamlining its operations. By 1997, IBM had farmed out the assembly of more than 30% of its desktop PCs, and in early 2002, it agreed to outsource desktop manufacturing to Sanmina-SCI Inc in a three-year, \$5-billion agreement.³⁸ In addition, it began to match its rivals on price and expanded the range of products available directly through direct marketing. Despite these moves, IBM's PC business remained a drag on company earnings, and its market share stalled around 7%.³⁹ Nonetheless, the company remained a major force in notebook computers, as well as in large corporate accounts.

Suppliers and Complements

There were two categories of suppliers to the PC industry: those supplying products that had many sources, such as memory chips, disk drives, and keyboards, and those supplying products that came from a small number of sources, notably microprocessors and operating systems. The components in the first category were widely available at highly competitive prices. Components in the second category were dominated by two firms: Intel and Microsoft.

Microprocessors (CPUs) Microprocessors were the hardware "brains" of a PC. In 2002, the market for Intel-compatible chips was roughly \$22 billion, compared to less than \$1 billion for PowerPC chips for the Mac.⁴⁰ While Intel was the sole producer of the 80386 market from 1986 through 1991, the market became more competitive in the 1990s. AMD, IBM, TI, and a variety of international semiconductor companies, including Taiwan's Via, challenged Intel in 386-, 486-, and Pentium-class microprocessors. Nonetheless, Intel remained the market leader by creating a powerful brand with its "Intel Inside" campaign, rapidly releasing new products, and slashing prices. Intel usually cut CPU prices by up to 50% per year. AMD made significant inroads into Intel's retail market share by promising to undercut Intel's prices by 25%. But AMD and Intel's other CPU competitors usually lost money on their microprocessor businesses.

Operating systems Operating systems were large pieces of software that managed a PC's resources and supported applications. Microsoft dominated the PC operating system market following the launch of the IBM PC. In the 1980s, Microsoft sold MS DOS, a relatively crude OS, to hardware manufacturers for \$15 per PC. DOS was much harder to use than the Mac OS, but it gained a wide audience. In 1990, Microsoft started to challenge Apple's technical supremacy by introducing Windows 3.0, followed one year later by Windows 3.1. Windows was a graphical user interface that cost \$15, on top of the \$15 for DOS. Although Windows 3.1 was widely adopted, it remained

markedly inferior to the Mac OS. It was only in 1995 that Microsoft significantly narrowed the gap, with the release of Windows 95. Windows 95 was an instant success, selling roughly 50 million copies in its first year. Microsoft received an average of \$40 for every copy of Windows 95 sold. In 1998, Microsoft upgraded its operating system again to Windows 98, raising prices to \$45 to \$50 per copy. Windows XP, released in October 2001, sold 17 million copies in its first eight weeks on the market. Developed at the cost of \$1 billion, analysts estimated that Microsoft's average revenues were between \$55 and \$60 for each copy of XP. Roughly 90% of new PCs worldwide shipped in the world in 2001 came with Windows 95, 98, or XP. In contrast, Apple's OS's accounted for only 3.6% of new license revenue in 2000.⁴¹

Application software The value of an operating system was tied directly to the quantity and quality of application software that was available on that platform. The Apple II, for example, was a hit in businesses because it supported VisiCalc, the first electronic spreadsheet. Other important PC application segments included word processing, presentation graphics, databases, desktop publishing, personal finance, education, entertainment, and the Internet. Throughout the 1990s, the number of applications available on PCs exploded while average selling prices for PC software collapsed. Microsoft was the number one seller of applications for both the Macintosh and Wintel PCs. However, tens of thousands of small independent software vendors (ISVs) wrote the majority of PC applications. In 2000, software for Windows comprised 88% of the total software for PCs, up from 81% in 1996. In contrast, Mac software share fell from 11% to 5% in the same period.⁴²

Alternative Technologies

By the late 1990s, personal computers, inspired largely by Apple, were far easier to use than they had been 20 years before. They were also entering the price range of consumer electronics for the first time. Nonetheless, a number of analysts believed that PCs had reached the end of the line. Lou Gerstner made the point most dramatically in IBM's 1998 annual report. In his letter to shareholders, IBM's chairman and CEO wrote, "The PC era is over." Others, such as Microsoft senior executive Craig Mundie, took a more moderate line: "This isn't the post-PC era; it's the PC-plus era."⁴³

Few observers predicted that PCs would disappear. Instead, they expected a variety of simpler computing devices to supplement and, to some extent, replace PCs. Some of these devices, such as the network computer, resembled the PC. (The network computer was a stripped-down machine that relied on a server to store data and applications.) Other devices looked more like consumer electronics, including handheld PDAs, smart phones, and TV set-top boxes. Even video game boxes were being touted as successors to PCs: the newest device, the Xbox offered by Microsoft, would allow consumers to play DVDs, CDs, and surf the Web, in addition to playing games.

Apple Turnaround?

After returning as Apple's leader, Steve Jobs moved quickly to shake things up. On August 6, 1997, he announced that Microsoft had agreed to invest \$150 million in its longtime rival and confirmed its commitment to developing core products, such as Office, for the Mac through August 2002. While the Apple faithful booed and hissed, the news sent Apple stock to a 52-week high, and Apple's board soon signaled its faith in Jobs by deferring the search for a permanent CEO.

Macs Jobs, who had long opposed cloning, abruptly brought the Macintosh licensing program to an end. Since the announcement of the first licensing agreement, clones had reached 20% of Macintosh unit sales, while the value of the Mac market had fallen 11%.⁴⁴ Convinced that clones were

cannibalizing Apple's installed base, Jobs refused to license Apple's latest OS to the major clone manufacturers. In addition, Apple spent \$110 million to acquire the assets of leading cloner Power Computing, including its license for the Mac OS.⁴⁵ Jobs also strengthened and consolidated Apple's product range, reducing the number of lines from 15 to 3. In November 1997, Apple introduced the G3 Power Macs, a series of high-end computers that were based on a powerful new PowerPC chip. G3 systems, which were targeted at business users, could also be used as network servers. Macintosh shipments increased in the quarter following their launch for the first time in two years. In May 1998, Apple followed up with a line of G3 PowerBooks, which was also well-received. The PowerMac G4 Cube, however, was priced too high for consumers at \$1,799 (monitor not included), and Apple suspended its production and sale just a few months after its release in July 2000.

Jobs's greatest coup was the launch of the iMac—"the Internet-age computer for the rest of us"—in August 1998. Priced at \$1,299, the iMac was Apple's first entry in the low-priced consumer market. The iMac lacked a floppy disk drive but incorporated a low-end CPU combined with a CD-ROM drive and modem, all housed in a distinctive translucent teal-and-white case. It also supported "plug-and-play" peripherals, such as printers, that were designed for Wintel machines. (Previous-generation machines required peripherals that were built for the Apple platform.) The iMac was Jobs at his best. Jobs initiated the project shortly after taking over at Apple and pushed it to completion in only 10 months. In his words, the iMac was "designed...to deliver the things consumers care about most—the excitement of the Internet and the simplicity of the Mac."⁴⁶ Jobs saw the iMac as a breakthrough product, just like the original Mac, and he hoped that it would restore the luster to Apple's brand. To promote the iMac, Apple launched a \$100 million advertising campaign, its largest ever.⁴⁷ Billboards went up across the United States, announcing, "I think, therefore iMac," and after Apple expanded the line to include five "fruit" flavors (blueberry was the most popular), candy-colored iMacs danced across TV screens nationwide, to the musical accompaniment of the Rolling Stones. Plenty of free publicity, generated by the first exciting new Apple product in years, helped Apple sell 278,000 iMacs in the first six weeks. Discounting by retailers pushed sales to 800,000 by the end of the year. According to one study, 32% of iMac purchasers were new computer buyers, while 13% were replacing Wintel machines.⁴⁸

Three and a half years after its launch, the original iMac had sold more than 6 million units (compared to over 300 million PCs sold during the same time frame). In January 2002, Jobs announced a new iMac with a new futuristic design, including a flat-panel display. The basic model cost \$1,300 and included a 700-megahertz PowerPC G4 chip, 128 megabytes of memory, a 40-gigabyte hard drive, a mono speaker, and a built-in CD burner. With two FireWire ports and five USB ports, Apple positioned the new iMac as a "digital hub" for cameras, camcorders, MP3 players, and other digital accessories.⁴⁹ While some critics called the new iMac "a continuation of Apple's form fetish," *Time Magazine* ran a cover story praising its performance and design.⁵⁰

The iMac line was only the most lavish example of Jobs's efforts to reenergize Apple's image. Soon after coming on board, he rehired TBWA Chiat/Day, the agency that designed the ads for the original Mac, and began to promote Apple with the quirky "Think different" campaign, which featured iconoclastic visionaries such as Albert Einstein and John Lennon. Jobs and TBWA Chiat/Day also sought to repeat their success in launching the Mac with a memorable Super Bowl spot in 1984.⁵¹ While the first ad had cleverly played off George Orwell's vision of a totalitarian future, casting Apple as a spirited insurgent against massive IBM, the 1999 version enlisted Hal, the human-like computer from the movie *2001*, to pitch Apple's cause.

Jobs hoped that Apple's reinvigorated image would bring back large numbers of independent software developers. But ISVs did not immediately flock back to Apple. Jobs had planned to launch a new OS in early 2001 that would be incompatible with most existing Mac programs. While

Microsoft had a huge installed base, many ISVs were uncertain about the volume opportunities for a new, incompatible Mac. To lessen the migration problem for customers, Jobs decided to ship each new computer with two operating systems: its older Macintosh OS (version 9), which would run Mac applications, as well as the new Mac OS X.⁵² The new operating system was UNIX-based, technically advanced, and offering a much more stable operating environment than previous Mac platforms.

Apple also redoubled its efforts to woo and support important developers, assigning an "evangelist" to look after each of its partners. Some developers noticed the change. Apple quickly lined up 400 ISVs who committed to deliver of 1,200 applications for OS X. According to a senior executive at Adobe Systems, which sold around \$300 million in Macintosh software each year, "In the last few years it was impossible for any developer to work with them. We couldn't rely on anything they said. We were absolutely convinced they were going to die." However, he continued, there had been "a 180-degree turnaround" since Jobs had taken charge.⁵³ According to Apple, the number of participants in its developer program increased by 75% in 2001 alone and included Unix as well as traditional Mac developers.⁵⁴

Other products In February 1998, Jobs shut down two divisions producing Apple's Newton and a portable computer aimed specifically at the education market. Apple had spent roughly \$500 million to develop these products over six years.⁵⁵ This move was part of Jobs's campaign to streamline Apple's business, which also slashed new project plans by 70%.⁵⁶ In 2000, Apple expanded into the peripherals market with devices like the iPod, a \$399 portable digital-music player, and software including iPhoto, iMovie, and iTunes. All of these products received high praise in the press, but worked only with a Macintosh.

Internal changes Jobs made it a top priority to improve Apple's operating efficiency. One of his first moves was to cut company perks, forcing most employees to travel coach and ending Apple's popular paid sabbatical plan. Jobs also pruned Apple's organization, eliminating units that duplicated efforts and centralizing responsibility for functions, such as marketing, in company-wide groups. Following restructuring efforts that had begun in 1996, Apple continued to reduce headcount, close facilities, and outsource manufacturing tasks. Apple also developed a close relationship with Taiwan-headquartered Foxconn Electronics, a contract manufacturer with 2001 revenues of \$18 billion. Apple outsourced to Foxconn the manufacturing of iMacs for worldwide distribution. Though its factories tended to be in less developed countries, Foxconn opened several design centers in the United States in order to be closer to its major clients such as Cisco, Compaq, Dell, and IBM as well as Apple.

Jobs also revamped Apple's distribution system, eliminating thousands of smaller outlets and expanding Apple's presence in national chains. In November 1997, Apple launched a Web site to sell directly to consumers for the first time. While the Web site did not offer lower prices, it allowed customers to order custom-designed systems. In announcing this move, Jobs showed off a bull's-eye plastered across a picture of Michael Dell and declared, "We're coming after you, buddy."⁵⁷ In late 2001, Apple's online store accounted for 43% of its sales, either directly to end users or via dealers.⁵⁸

On May 19, 2001, Apple opened the first Apple Computer retail store in McLean, Virginia, in an attempt to sell more effectively than it could at the warehouse electronics stores, where Macs competed for shelf space with other major brands. At the end of 2001, Apple had 27 company-owned boutiques in major cities and high-traffic suburban malls across the United States, and planned to construct 73 more over the next several years. In the last quarter of 2001, Apple lost \$8 million on \$48 million in sales. Critics compared Apple's retail foray to Gateway's battered Country Stores, where unit sales were half of what they were in 1998. Gateway shuttered 62 of its 337 stores in 2001.⁵⁹ However, the Apple stores attracted 800,000 customers in the month of December 2001. Apple claimed 40% were new customers.

By early 2002, many of Jobs's efforts were paying off. Apple had \$4.3 billion in cash and short-term investments. Inventory was down to less than two days worth of sales, and Apple had cut its cash conversion cycle from 53 to -22 days. (See Exhibit 8.) At a time when other PC companies were cutting research expenditures, Apple increased its 2001 R&D budget to 8% of net sales, up from 5%.

However, Apple's 2001 sales of \$5.4 billion were down 32% from the previous year. Its net loss of \$25 million included an operating loss of \$344 million offset by \$217 million in interest and other income and \$88 million in non-current gains. Some analysts attributed the 2001 dip to normal product cycle fluctuations prior to the new iMac release. Others, however, claimed that Apple had lost strength in its core niche markets while it still lacked mainstream consumer support. (See Exhibit 9.) In the education market, for example, Apple's market share fell from 46% to 23% between 1995 and 2000, due in part to Apple's poorly timed reorganization of its K-12 sales system at the very height of the 2000 school selling season.⁶⁰

Apple's Strategy Going Forward

Some observers doubted the sustainability of Apple's turnaround. At times, it was unclear whether Apple was targeting a well-defined niche-market or trying to sell to the masses. In 2002, Phil Schiller, vice president for worldwide product marketing, identified three customer segments that Apple's recent activities targeted:

First, we want to take a look at our existing customers, because we never want to lose sight of that incredibly loyal base of 25 million active Mac users. They are our best advocates and salespeople. The second group is new users. We find that when they take the opportunity to look at a Mac vs. a PC, we do really well, much higher than our current market share. So the key thing is getting them to consider a Mac. That's what the retail stores are for. The third group is the Windows switchers. Sometimes it's a person who once used a Mac in school, and was later arm-twisted into using a PC where they went to work. If we continue to do great things, more and more of these people will get a Mac.⁶¹

In response to these apparent attempts to branch out, one analyst noted:

Apple often has trouble reconciling its megalomania with a practical reasoning of its own position. They just want to sell to the horizontal market and get all consumers to convert to their platform. That would be like BMW trying to sell its latest model to every American household. It's just unlikely to happen in Apple's current structure.⁶²

In 2002, the same questions were on everyone's mind: could Apple maintain its niche and remain a viable independent standard? Was that route best for the company? Jobs, however, was always confident remained supremely confident about the future of his company. As he told *Fortune* magazine:

We own one of only two high-volume operating systems in the world. Everyone completely overlooks this. Microsoft has come to believe that offering an operating system is like printing money. Well, Dell can't print money. Compaq can't print money. But Apple can print money.⁶³

Exhibit 1 Apple Computer: Selected Financial Information, 1981-2001 (\$ millions, except employee and per-share data)

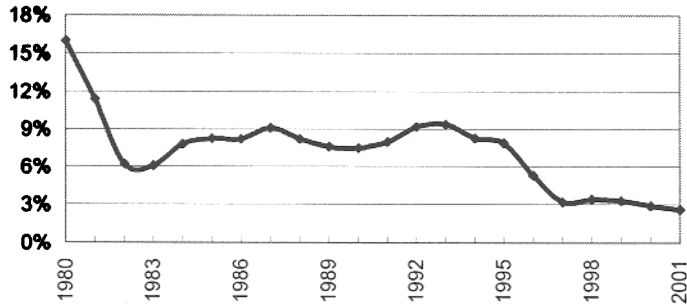
	1981	1986	1991	1996	1997	1998	1999	2000	2001
Net sales	334	1,902	6,309	9,833	7,081	5,941	6,134	7,983	5,363
Cost of sales	170	891	3,314	8,865	5,713	4,462	4,353	5,733	4,026
Research and development	21	128	583	604	485	310	314	380	441
Selling, general, and administrative	77	610	1,740	1,568	1,286	908	1,310	1,546	1,568
Operating income (loss)	66	274	447	(1,383)	(1,070)	261	386	620	(333)
Net income (loss)	39	154	310	(816)	(1,045)	309	601	786	(25)
Cash, cash equivalents, and short-term investments	73	576	893	1,745	1,459	2,300	3,226	4,027	4,336
Accounts receivable, net	42	263	907	1,496	1,035	955	681	953	466
Inventories	104	109	672	662	437	78	20	33	11
Net property, plant, and equipment	31	222	448	598	486	348	318	313	564
Total assets	255	1,160	3,494	5,364	4,233	4,289	5,161	6,803	6,021
Total current liabilities	70	138	1,217	2,003	1,818	1,520	1,549	1,933	1,518
Total shareholders' equity	177	694	1,767	2,058	1,200	1,642	3,104	4,107	3,920
Cash dividends paid			57	14	--	--		--	--
Permanent full-time employees	2,456	4,950	12,386	10,896	8,437	6,658	6,960	8,568	9,603
International sales/sales	27%	26%	45%	52%	50%	45%	43%	46%	44%
Gross margin	49%	53%	47%	10%	19%	25%	29%	28%	25%
R&D/sales	6%	7%	9%	6%	7%	5%	5%	5%	8%
SG&A/sales	23%	32%	28%	16%	18%	15%	21%	19%	29%
Return on sales	12%	8%	5%	NM	NM	5%	10%	10%	NM
Return on assets	24%	15%	10%	NM	NM	7%	12%	12%	NM
Return on equity	38%	25%	19%	NM	NM	22%	19%	19%	NM
Stock price low	\$7.13	\$10.88	\$40.25	\$16.00	\$12.75	\$13.50	\$14.25	\$25.38	\$13.63
Stock price high	\$17.38	\$21.94	\$73.25	\$35.50	\$29.75	\$43.75	\$40.06	\$75.19	\$27.12
P/E ratio at year-end	27.7	16.8	21.9	NM	NM	17.5	15.1	10.6	NM
Market value at year-end	1,224	2,578	6,650	2,598	1,671	5,540	10,181	8,644	5,443

Source: Apple financial reports; Datastream International; Standard & Poor's Compustat.

All information is on a fiscal-year basis, other than share price data, which are on a calendar-year basis. Apple's fiscal year ends in September.

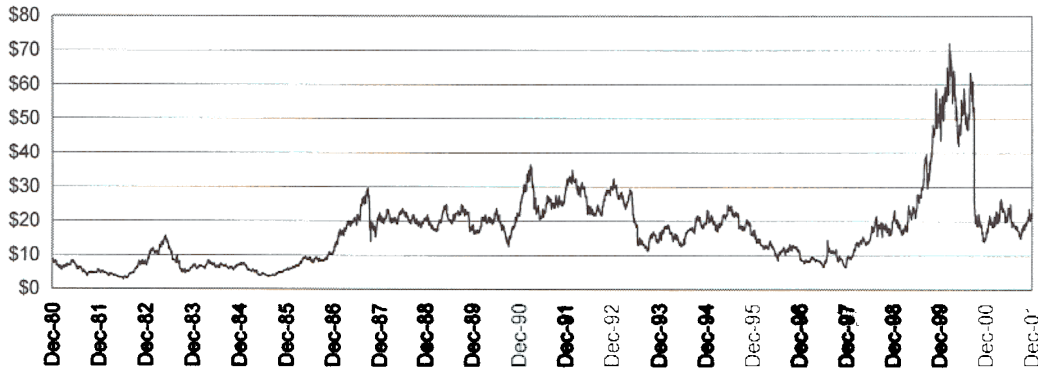
NA = Not Available; NM = Not Meaningful.

Exhibit 2 Apple's Share of the Worldwide Personal Computer Market, 1980-2001



Source: InfoCorp, International Data Corp.; Dataquest; AMN AMRC

Exhibit 3 Adjusted Daily Closing Share Price, Apple Computer, 1980-2001



Source: Adapted from Datastream International.

Exhibit 4 Shipments and Installed Base of Various Microprocessors, 1992-2002E (millions)

	1992	1994	1996	1998	1999	2000	2001	2002E
Total Shipments of Intel Technologies								
Units shipped	30.6	47.8	76.0	105.0	140	156	146	165
Installed base	122.2	211.4	347.5	542.5	653	839	985	1,115
Motorola (680X0)								
Units shipped	3.9	3.9	0.8	0.2	NM	NM	NM	NM
Installed base	16.5	24.9	26.8	27.5	NM	NM	NM	NM
PowerPC								
Units shipped	0	0.8	4.0	3.5	3.4	4.6	3.1	NA
Installed base	0	0.8	7.8	14.1	17.5	22.1	25.2	NA

Source: Dataquest, InfoCorp, and casewriter estimates.

Note: 5% to 10% of total microprocessor shipments go into non-PC end products. Roughly 30% to 40% of the total installed base represented older technologies that were probably no longer in use.

NA = Not Available; NM = Not Meaningful.

Exhibit 5 Personal Computer Average Selling Prices, 2000-2005

	2000	2001	2002	2003	2004	2005	CAGR, 2000-2005
Desktops	\$1,367	\$1,240	\$1,124	\$1,080	\$1,037	\$ 997	-6%
Portables	2,183	1,976	1,849	1,747	1,656	1,569	-6%
PC servers	5,923	5,388	5,175	5,028	4,924	4,798	-4%
Total	\$1,656	\$1,517	\$1,407	\$1,353	\$1,303	\$1,254	-5%

Source: IDC report #24501 (2001); casewriter estimates.

CAGR = Compound Annual Growth Rate.

Exhibit 6 Worldwide Personal Computer Market, 1998-2000 (% of unit shipments)

	1998	1999	2000	CAGR of Units Sold, 1998-2000
Compaq	14.4	14.2	13.3	16.1
IBM	8.8	8.1	7.0	7.8
Dell	8.6	10.6	11.5	39.7
Hewlett-Packard	6.4	6.8	8.0	35.1
Packard Bell NEC	4.5	5.3	4.5	20.8
Gateway	4.0	4.3	4.0	20.8
Fujitsu	3.7	5.4	5.0	40.5
Toshiba	3.5	2.8	3.0	11.9
Apple	3.4	3.5	3.0	13.5
Total shipments (thousands of units)	89,824	110,643	131,145	20.8

Source: International Data Corp.; Infotech,; casewriter estimates.

CAGR = Compound Annual Growth Rate.

Exhibit 7 Apple Competitors: Selected Financial Information, 1996-2001 (\$ millions)

	1996	1997	1998	1999	2000	2001
Compaq						
Total revenues	20,009	24,584	31,169	38,447	42,222	33,554
Cost of sales	14,855	17,833	23,980	29,798	32,417	26,442
R&D	695	817	1,353	1,660	1,469	1,305
SG&A	2,507	2,947	4,978	6,341	6,044	5,328
Net income	1,318	1,855	(2,743)*	569	569	(785)
Total assets	12,331	14,631	23,051	27,277	24,856	23,689
Total current liabilities	4,741	5,202	10,733	11,838	11,549	11,133
Total stockholders' equity	7,290	9,429	11,351	14,834	12,080	11,117
Gross margin	26%	27%	23%	22%	23%	21%
R&D/sales	3%	3%	4%	4%	3%	4%
SG&A/sales	13%	12%	16%	16%	14%	16%
Return on sales	7%	8%	NM	1%	1%	(2%)
Market value at year-end	20,141	42,771	71,400	45,843	25,419	16,592
Dell Computer						
Total revenues	5,296	7,759	12,327	18,243	25,265	31,888
Cost of sales	4,229	6,093	9,605	14,137	20,047	25,445
R&D	95	126	204	272	374	482
SG&A	595	826	1,202	1,788	2,387	3,193
Net income	272	518	944	1,460	1,666	2,177
Total assets	2,148	2,993	4,268	6,877	11,471	13,435
Total current liabilities	939	1,658	2,697	3,695	5,192	6,543
Total stockholders' equity	973	806	1,293	2,321	5,308	5,622
Gross margin	20%	21%	22%	23%	21%	20%
R&D/sales	2%	2%	2%	1%	1%	2%
SG&A/sales	11%	11%	10%	10%	9%	10%
Return on sales	5%	7%	8%	8%	7%	7%
Market value at year-end	9,569	27,421	93,113	67,951	98,978	70,858
IBM						
Total revenues	75,947	78,508	81,667	87,548	88,396	85,866
Cost of sales	45,408	47,889	50,795	49,460	51,459	54,084
R&D	4,654	4,877	5,046	5,505	5,374	5,260
SG&A	16,854	16,634	16,662	16,294	17,535	17,197
Net income	5,429	6,093	6,328	7,712	8,093	7,723
Total assets	81,132	81,499	86,100	87,495	88,349	88,313
Total current liabilities	34,000	33,507	36,827	39,578	36,406	35,119
Total stockholders' equity	21,628	19,816	19,433	20,511	20,624	23,614
Gross margin	40%	39%	38%	44%	42%	37%
R&D/sales	6%	6%	6%	6%	6%	6%
SG&A/sales	22%	21%	20%	25%	24%	20%
Return on sales	7%	8%	8%	9%	9%	9%
Market value at year-end	78,408	101,713	170,151	192,472	148,147	208,371

	1996	1997	1998	1999	2000	2001
Intel						
Total revenues	20,847	25,070	26,273	29,389	33,726	26,539
Cost of sales	9,164	9,945	12,144	11,836	12,650	13,487
R&D	1,808	2,347	2,509	3,111	3,897	3,796
SG&A	2,322	2,891	3,076	3,872	5,089	4,464
Net income	5,157	6,945	6,068	7,314	10,535	1,291
Total assets	23,735	28,880	31,471	43,849	47,945	44,395
Total current liabilities	4,863	6,020	5,804	7,099	8,650	6,570
Total stockholders' equity	16,872	19,295	23,377	32,665	37,322	35,830
Gross margin	56%	60%	54%	60%	62%	49%
R&D/sales	9%	9%	10%	11%	12%	14%
SG&A/sales	11%	12%	12%	13%	15%	17%
Return on sales	25%	28%	23%	25%	31%	5%
Market value at year-end	107,447	114,718	197,644	274,428	202,047	211,092
Microsoft						
Total revenues	8,671	11,358	14,484	19,747	22,956	25,296
Cost of sales	1,188	1,085	1,197	2,814	3,002	3,455
R&D	1,432	1,925	2,798	2,970	3,772	4,379
SG&A	2,973	3,218	3,845	3,953	5,176	5,742
Net income	2,195	3,454	4,490	7,785	9,421	7,346
Total assets	10,093	14,387	22,357	37,156	52,150	59,257
Total current liabilities	2,425	3,610	5,730	8,718	9,755	11,132
Total stockholders' equity	7,543	10,777	16,627	28,438	41,368	47,289
Gross margin	86%	90%	92%	86%	87%	86%
R&D/sales	17%	17%	19%	15%	16%	17%
SG&A/sales	34%	28%	27%	20%	23%	23%
Return on sales	25%	30%	31%	39%	41%	29%
Market value at year-end	98,752	155,965	345,826	422,640	460,771	356,806
Hewlett-Packard						
Total revenues	38,420	42,895	47,061	42,370	48,782	45,226
Cost of sales	24,202	26,763	29,943	28,404	33,709	32,279
R&D	2,718	3,078	3,355	2,440	2,646	2,670
SG&A	9,195	10,237	11,148	8,962	10,029	9,722
Net income	2,586	3,119	2,945	3,491	3,697	408
Total assets	27,699	31,749	33,673	35,297	34,009	32,584
Total current liabilities	10,623	11,219	13,473	14,321	15,197	13,964
Total stockholders' equity	13,438	16,155	16,919	18,295	14,209	13,953
Gross margin	37%	38%	36%	33%	31%	29%
R&D/sales	7%	7%	7%	6%	5%	6%
SG&A/sales	24%	24%	24%	21%	21%	21%
Return on sales	7%	7%	6%	7%	7%	1%
Market value at year-end	51,095	64,932	70,848	115,911	62,431	39,848

Sources: Company financial reports; Disclosure; Datastream International.

NA = Not Available; NM = Not Meaningful.

Note: All information is on a fiscal-year basis, other than market value data, which are on a calendar-year basis. The fiscal year ends in January for Dell, in June for Microsoft, and in December for Compaq, Intel, IBM, and Gateway.

^aReflects a \$3.2 billion charge for purchased in-process technology arising from the acquisition of Digital Equipment Corp. Figures given here for R&D generally exclude such charges.

Exhibit 8 Personal Computer Manufacturers: Operating Performance

	1997	1998	1999	2000	2001
Gross Margin (%)					
Apple	21	27	29	28	25
Compaq	29	26	26	27	21
Dell	23	23	21	21	
Gateway	18	22	24	23	
Inventory Days					
Apple	35	21	4	2	
Compaq	28	28	25	24	26
Dell	9	6	6	6	6
Gateway	18	13	10	12	
Cash Conversion Cycle^a (days)					
Apple	53	17	-16	-34	-22
Compaq	16	21	35	39	61
Dell	-18	-16	-21	-24	-11
Gateway	12	-6	-14	-3	4

Source: Company financial reports.

Note: Data are on a fiscal-year basis. The fiscal year ends in January for Dell, in September for Apple, and in December for Compaq and Gateway.

^aCash conversion cycle = average number of days of sales in inventory + average number of days of sales in accounts receivable – average number of days of sales in accounts payable.

Exhibit 9 Apple's Market Segment Share and Revenue Contribution

	1995		1998		2001	
	% Apple Revenue	Market Share	% Apple Revenue	Market Share	% Apple revenue	Market Share
Home	32.1%		25.9%		28.1%	
Small Office	12.7%		12.0%		10.5%	
Small Business	14.9%		16.0%		12.8%	
Medium Business	9.4%		10.8%		7.3%	
Large Business	10.8%		11.5%		4.7%	
Government	2.3%		2.0%		1.2%	
Education	17.8%		21.8%		35.4%	

Source: International Data Corp.'s *PC Tracker*; industry analysts.

Notes: IDC calculations based solely on PC revenue and does not include software, "out-of-the-box" products, or services. Market share = share of worldwide unit shipments in a given year. Small Office = sites with fewer than 10 employees; Small Business = sites with 10 to 99 employees. Medium Business = sites with 100 to 499 employees. Large Business = sites with more than 500 employees.

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