

Apple Computer: The iCEO Seizes the Internet

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Since its founding in 1977, Apple Computer, Inc. followed a path unique within the PC industry. In its products, brand image and technology strategy, Apple had pursued an idiosyncratic, go-it-alone strategy which had variously been ascribed to a flower child corporate culture or a desire to maintain the rich profit margins historically afforded proprietary computer systems manufacturers.

Apple was the only first generation U.S. PC manufacturer to survive the increased competition brought by the IBM PC. With its Macintosh personal computer, it led the industry shift from text-based to graphical user interfaces. By the mid-1990s, it was the only sizable PC maker outside the “IBM PC” standard.¹ And with its “1984” and “Think Different” advertising campaigns, it had proudly emphasized its distinctiveness, even in the face of the overwhelming popularity of the IBM PC compatibles.

As Apple began its third decade, doubts were raised about its continuing existence. It faced three crucial challenges:

- because it was outside of the Windows camp, it had to continue its research & development for its operating system and systems technology, a job that its PC rivals almost entirely delegated to Microsoft and Intel;
- like any PC maker, it must continually design and manufacture new desktop and laptop computers that balanced performance, reliability, styling and cost; and
- it needed to improve the operational efficiency of the firm across the board, from its procurement and manufacturing to its sales, distribution and support.

The E-commerce alternatives adopted by Apple were intended to address the last issue. But it was clear that — unlike distribution oriented PC assemblers such as Dell and Gateway — even the best operational efficiencies would not be enough to save the company if the company failed to innovate. At the same time, the increasing commoditization of the PC industry and the Mac’s declining differentiation over Windows meant that — at best — Apple faced permanently reduced operating margins. The worst came in 1996-1997, when Apple suffered cumulative losses totaling nearly \$2 billion.

During the 1980s and early 1990s, Apple had pioneered electronic communications with its dealers and developers using its proprietary online services. By 1997, such e-services had shifted entirely to open standard Internet technologies such as e-mail, World Wide Web and secure online commerce. These Internet technologies sustained a program of business process re-engineering that improved the operational efficiency of the company, at a time when a maturing industry brought price wars and declining margins for all PC makers.

At the same time, these open technologies were used to support an updated version of the company’s historic, go-it-alone, proprietary strategy which had been consigned by industry growth to a niche within the PC industry. The global reach of the Internet enabled Apple to reach its geographically dispersed customer base at a time when its market share had reached a historic low, enabling it remain viable as it planned new growth strategies.

1. From Innovation to Crisis

Apple Computer was a pioneer in the PC industry, with one of the longest tenures and records of innovation. At the same time, its early success kept it in a proprietary, vertically-integrated strategy which some believe limited its future after the success of the multi-vendor “Wintel” standard.²

Apple made three major efforts to develop a more powerful business-oriented PC to complement the Apple II: the Apple III, Lisa and Macintosh. All three efforts began before the release of the IBM PC.

The most successful was the Macintosh. It eventually acquired the 16-bit processor, GUI and system software from its Lisa predecessor. After many delays, the Mac was introduced in January 1984, using the infamous “1984” Super Bowl television ad that linked IBM PC users to an Orwellian nightmare (Moritz 1984: 128-134; Levy 1995; Linzmayer 1999: 63-77).

The Macintosh also offered most businesses and individuals their first opportunity to take advantage of menu-based user interface, WYSIWYG high-resolution display, and various other innovations that were taken for granted by later computer users. But its adoption was slowed by price and its lag on key features like a hard disk, color display and application software.

Apple achieved unique differentiation with its Macintosh, and from 1989-1993 enjoyed increasing market share and revenues. However, Apple’s revenues peaked in mid-1995 just prior to the introduction of Windows 95, and for two years its revenues, market share and profit margins resembled an uncontrolled freefall.

Apple’s decline during the mid-1990s has two popular explanations (West 2001). The first focuses on its standards strategy, which unlike all rivals eschewed licensing and joining the “Wintel” alliance of PC makers. The second explanation points to a combination of strategic and operational errors — particularly in product design and inventory management — which would have made it impossible for Apple to compete even as a Wintel PC maker.

Go-it Alone Standards Strategy

By the mid-1990s, Apple remained unique in the PC industry in its standards strategy. As a PC maker, it was unlike other PC makers in that it did not license the MS-DOS (later Windows) operating system from Microsoft and purchase Intel-compatible processors from Intel and its rivals. As an operating system vendor, unlike Microsoft it did not license its OS to other companies in an attempt to get the standard widely adopted. Internal debate over these licensing questions wracked Apple from 1985-1994.

At the end of 1994 Apple started licensing comparatively weak companies to make clones. Although Apple refused to license strong competitors such as Gateway 2000, within two years the clones captured about 20% of the Mac market, while at the same time the Mac’s share of the overall PC market declined. In the summer of 1997, when Steve Jobs took over as interim CEO, Apple unilaterally ended cloning, citing the failure of clones to attract new users (*MacWEEK.com*, 1997; Carlton 1997a; Linzmayer 1999).

However, by spurning the “Wintel” standard, Apple was forced to fund its own sizable ongoing R&D efforts. It also missed the opportunity to enjoy the huge economies of scale enjoyed by other PC makers which used standardized components in ever-increasing volumes (Dedrick & Kraemer 1998).

Failure to Respond to Windows Challenge

The licensing issue was claimed by many to be the central explanation for Apple’s financial and market share decline. However, others have argued that Apple’s problems can be attributed to other strategic and operational errors (Carlton 1997a; Malone 1999; West 2000).

West (2001) lists several other possible explanations for Apple’s problems during the 1990s, which include:

- pricing to maximize gross profit margins rather than market share;
- some \$1.5 billion in abandoned R&D efforts, directed to unsuccessful efforts to diversify out of PCs into set-top boxes, handheld computers, personal computers and other business lines;
- a 17-year delay in producing a next-generation operating system to replace the Mac OS;
- poor forecasting and inventory management that brought losses exceeding \$1 billion; and
- a series of weak CEOs that focused on selling Apple to the highest bidder rather than running it as a going concern.

In the end, Apple pursued a strategy based on differentiation but failed to maintain its differentiation. It had plenty of warning with Windows 3.0 (1990) and Windows 3.1 (1991), but still was unable to respond when the 1995 introduction of Windows 95 virtually eliminated its perceived ease of use advantage. The result was a two-year free fall in market share and revenues that brought losses totaling nearly \$2 billion. The two years of bad news brought new management and, eventually, a revised business strategy encompassing product design, manufacturing, supply chain management, which in turn led to Apple's first direct online PC sales.

2. Revised Business Strategy

After record revenues in the fiscal year September 1995, Apple faced two years of declining revenues and operating losses that brought the ouster of two CEOs, first Michael Spindler (Jan. 1996) and Gilbert Amelio (July 1997).

In the face of this financial severe pressure, Amelio and particularly his successor Steve Jobs both changed the company's business strategy and focused on improvements in operational efficiency. Coupled with declining gross margins and termination of failed R&D efforts, the business model of Apple at the end of the decade bore only limited resemblance to that at the beginning of the decade. The groundwork was laid by a business process re-engineering plan developed by Andersen Consulting in the mid-1990s.

Technology

With both its system software group and its proprietary hardware designs, Apple maintained significantly higher R&D spending (ca. 5% of net revenues) than other PC manufacturers such as Dell and Gateway (less than 2%).³ This was possible due to the company's gross margins, at 27% the highest in the industry. However, in fiscal year 2000, the 4.8% R&D margin reflected both a percentage drop from 1993 and earlier (when it was above 8%) and also a decline in absolute terms as revenues remained below their 1995 peak. The decline reflected cuts in R&D spending for many hardware and system software areas, although Apple increased the proportion of R&D spent on applications software.

The Macintosh standards architecture, like all computer architectures, incorporates two different types of standards (West 2000). The multiple layers of interdependent standards that define application programming interfaces (APIs) and thus the availability of software complementary assets (West & Dedrick 2000). Apple continued to maintain distinct APIs from the Windows operating system and compete directly with it.

The other element of a PC architecture is the cluster of heterogeneous standards used for connecting peripheral hardware. In 1997, Apple shifted the Macintosh architecture from its original proprietary hardware interfaces to near-total reliance on cross-platform and Windows-specific standards. This made it easier for Apple products to inter-operate in organizations and a society that was largely Windows-centric.

For hardware, it also allowed Apple to take advantage of semiconductors, connectors, cables, peripherals and components that were manufactured and distributed for the much larger Wintel value chain (West 2000). In particular, Apple's standards convergence approach

- reduced or eliminated initial R&D costs paid by third party hardware developers;
- reduced the need for dealers to inventory both Windows and Mac products, thus making a wider range of products available to Mac buyers; and
- improved the availability of components to Apple for system assembly, when compared its early dependency on outside vendors for Mac-specific components.

Apple shifted hard disks from SCSI to ATA interfaces, video output from its proprietary connector to VGA, printers from serial to USB, and keyboard/mice from its proprietary ADB to USB. In most cases, the shift tapped into an existing supply of components and peripherals. With USB, Apple's products created a demand for USB peripherals as most Wintel machines remained focused on legacy technologies (Mossberg 1999).

On the software side, Apple continued to maintain a large operating system group. However, during the mid-1990s it reduced software R&D by ending ambitious and unsuccessful projects such as the Taligent and Copland operating system ventures, discontinuing most non-PC R&D in peripherals and PDAs, and also using attrition to reduce overall staff. With the return of Steve Jobs, Apple increased its R&D emphasis on bundled application software, seeking to distinguish the Mac OS from Windows using applications such as Sherlock, iMovie and iTunes.

Market Segmentation

In the early 1990s, under John Sculley Apple had pushed hard to win market share in Fortune 1000 companies, but Apple had both a disadvantage of price and the head start of IBM PC compatibles, and made only limited inroads. During late 1997 and throughout 1998, most large corporations that had standardized on the Macintosh (either as the primary computer or co-equal status with Windows machines) eliminated support for the Mac, or relegated it to only a few departments.

Loyal Macintosh users continued in organizations or positions where such non-standard usage was acceptable. But by mid-1998, Apple's sales were concentrated primarily in three areas:

- graphics/design
- education
- consumers (home users).

The Macintosh's high-resolution graphics and ease of advantage over MS-DOS had made it a natural for software developers who created the "desktop publishing" segment, which was widely credited as saving Apple and the Macintosh (Kawasaki 1990: 20-22). Apple's strength in this comparatively high end professional market was complemented by its remaining customers, concentrated in education and consumer segments. The majority of these latter users were among the most price sensitive of any PC buyers.

Apple defined its competition as being other name-brand vendors such as IBM, HP and Compaq; even compared to these vendors, Apple had historically charged a premium for its Macintosh, both based on its higher cost structure and its belief that its differentiation (or switching cost of its installed base) allowed it to exact such a premium. The premium grew as aggressive price-cutting periodically swept the Wintel-based PC industry, forcing Apple to re-evaluate all aspects of its business model — notably its manufacturing efficiencies and product

design — and introduce new products such as the 1990 Classic (\$995) and the 1998 iMac (\$1299), which by mid-2000 was offered in a range of configurations priced at \$799 to \$1499.

In the consumer market, its existing customers remained because of high switching costs (West 2000). Beginning with the 1998 introduction of the iMac, Apple successfully targeted new computer users by offering an easy-to-set-up Internet computer. Surveys commissioned by Apple reported that 32% of U.S. buyers and 46% of Japanese iMac buyers in the last three months of 1998 were first-time computer owners (Apple 1999a, 1999b).

Overall, Apple ended the decade doing best in the three segments that were its strongholds at the beginning of the decade — although both consumers and education were transformed by the Internet, and the design segment had expanded from paper-oriented graphic arts to include web page and video production. But 10 years later, Apple's positions in these segments was far less secure, and it lacked the resources, product differentiation and momentum to expand its reach in other segments such as large businesses.

Product Line Simplification

During its period of increasing market share, unit sales and revenues in the early 1990s, Apple had increased its distribution channels from traditional computer retailers to consumer electronics dealers (such as Best Buy) and office supply dealers (e.g. Office Depot). Partly as a consequence, Apple had proliferated the number of product lines and models, to support a variety of price points. As with many PC makers, the proliferation of product lines obfuscated the differences between the lines — to some degree, intentionally, to make comparison shopping between channels more difficult.

With the collapse of Apple's sales and share, it could no longer support either the proliferation of models or channels. Therefore, in May 1998, Jobs introduced its so-called 2x2 product strategy, in which it planned two different models (a desktop and laptop) for each of the professional and consumer segments. As its 1998 10-K statement reported,⁴ “the Company simplified its product line, moving from approximately 15 separate individual products to three main product families.”

The company's existing Power Mac and PowerBook models were retargeted for professionals and high-end consumers and educators. However, each model was simplified to a single design, with the exception of processor, RAM and hard disk configuration. In August 1998, Apple released the iMac, its consumer desktop. The final quadrant, the consumer laptop, was filled a year later with the introduction of the iBook.

In July 2000, Apple added a second professional desktop with the release of its “Cube,” a restyled version of its PowerMac G4 featuring smaller footprint at a higher price and limited expandability. Apple overestimated the premium buyers would pay for elegant design, and the sales were one-third that expected, contributing to its quarterly loss at the end of calendar 2000. As one analyst commented, “Sometimes when you get overly focused on the cool end, you forget it's a product. I think that's what happened with the Cube” (Fried 2001).

The product line simplification “allowed the Company to more accurately forecast demand, reduce inventory carrying levels and related costs, lessen the financial exposure resulting from inventory obsolescence and excess inventory levels, and reduce the component cost of obtaining certain standardized parts” (Apple 1998 10-K). Apple reduced its reported supply in inventory from 31 days (1997) to 6 (1998) and finally to 2 (1999).

Shift to Outsourced Manufacturing

Apple had traditionally manufactured its digital logic boards (motherboards) and assembled its own personal computers. But in the face of cost pressures (and subsequent losses), during the 1990s it shifted production to less expensive sites and eventually to contract manufacturing (Table 1).

In 1983 it had built a highly-automated (and highly-publicized) new factory in Fremont, California to assemble the original Macintosh, but closed the Fremont factory in 1992. Product assembly was shifted to its logistics center in Elk Grove, California, a Sacramento suburb. Circuit board production was shifted to shifted to the plant in Fountain, Colorado (south of Colorado Springs) which Apple bought from Data General in 1991, as well as its two overseas plants (Weber 1992).

The company had opened plants in Cork, Ireland in 1980 and Singapore in 1981, originally to assemble Apple II computers. From that point forward, most products were assembled at least three locations, respectively for the Asian, European and Western Hemisphere (“Americas”) markets. The Singapore plant was also used for worldwide production of some low-cost products such as the 1990 Macintosh Classic, the first Macintosh model under \$1000.

After controlling its own final assembly, in 1996 Apple shifted towards having both circuit boards and final assembly done by contract manufacturers. In April 1996, it sold its Fountain factory to SCI Systems, a major contract manufacturer. As part of the agreement, Apple committed to fixed purchase levels for three years, agreeing to purchase from SCI 60% of its logic boards and 40% of its computer systems for the Western Hemisphere, declining to 40% and 30% respectively in the 12 months ending June 1999 (Apple 10-Q statement, August 1996).⁵

When it introduced the iMac in 1998, Apple began production at its factories in Sacramento, Cork and Singapore (Kirkpatrick 1998). However, in February 1999 Apple reported a \$9 million charge to outsource nearly all iMac production to three regional factories operated by LG. The Korea-based firm had previously made all iMac cases and monitors in Korea for Apple’s three

Table 1: Apple spin-off and production outsourcing decisions, 1996-2000

Fiscal Year	Asia	Americas	Europe
1996		Sold Colorado PC/circuit board factory to SCI, entered outsourcing agreement	
1997	Sold circuit board factory to NatSteel, entered outsourcing agreement		Sold Netherlands distribution center
1998	Outsourced PowerBook G3 production to Quanta in Taiwan		
1999	Outsourced iMac assembly to LG in Korea Outsourced worldwide iBook production to Alpha Top (GVC) in Taiwan	Outsourced iMac assembly to LG in Mexicali, Mexico	Outsourced iMac assembly to LG in Wales
2000	Shifted iMac assembly to Hon Hai in Shenzhen, China		Shifted iMac assembly to Foxconn (Hon Hai) in Czech Republic

Source: Company 10-K reports, company officials, news reports

regional factories. In 2000, Apple shifted most European and Asia assembly from LG to Hon Hai of Taiwan.

Apple made a similar push in its laptop products. Its first model of the PowerBook G3 was produced in Apple factories, but it outsourced worldwide production of its next three models (introduced in 1998, 1999 and 2000) to Quanta in Taiwan, which had previously produced the 1995 low-end PowerBook 1400. In 1999 Apple outsourced production of its new iBook to Alpha Top Corp. in Taiwan, a subsidiary of GVC Corp. The September 1999 earthquake that killed more than 2,200 people in Taiwan also disrupted computer production, including that of Apple's laptops (Barker 1999).

The product line simplification, outsourcing, and 1997 changes in its distribution policies, reduced the proportion of Apple's revenues spent on sales, general and administrative expenses (SGA), and helped it return operating margins to pre-1995 levels.

PC Industry Pressures

The PC industry of the year 2000 reflected a far different landscape overall than when the IBM PC appeared nearly 20 years earlier.

The industry had enjoyed periodic technological breakthroughs which both attracted new customers and also motivated existing organizational and individual buyers to trade in their existing PCs for new models. The most successful such breakthroughs came with the introduction of the CD-ROM in the early 1990s and Windows 95 in 1995. The industry also attracted new home users with the spread of the Internet and World Wide Web from 1994-1998.

However, by 2000 the PC industry had reached saturation in the developed countries of North America, Europe and Japan. The maturation of the industry meant commodization and price competition, led by the industry's cost leader, Dell Computer. In response to pressure from Dell, some vendors sought to match its costs while a few sought differentiation in niche markets. The inventor of the Wintel PC, IBM, exited the consumer PC market in 1999 because its higher R&D costs prevented it from matching Dell's cost structure (Bulkeley 2002).

Apple maintained the most differentiation of any PC maker. But the price cuts and heavy marketing expenditures of rival PC makers (not to mention Microsoft) forced it to respond both with innovation and operational efficiencies in order to maintain its greatly-reduced market share.

3. Organization of Business Activities

Although in December 1996, Apple nominally purchased NeXT Software, both internally and externally the transaction was subsequently referred to as a NeXT takeover of Apple, as when the *Wall Street Journal* reported that "In many ways, NeXT now appears to be taking over Apple rather than the other way around, as Mr. Jobs and his aides fill a power vacuum at the rudderless PC maker" (Carlton 1997b).

A key measure was the composition of Apple's top management team. With February 1997 folding of NeXT into Apple, Jobs successfully lobbied then-CEO Amelio to reorganize Apple's R&D and appoint key NeXT executives to head it. That summer, Jobs became acting CEO, appointed a new board, and continued to fill key slots. By early 1998, four of the six executive officers were NeXT employees at the time of its purchase, and a fifth was NeXT's former VP of hardware design.

Only one holdover remained, the company's widely respected CFO, Fred Anderson, who'd joined Apple in April 1996. He was later joined by Tim Cook, the company's newly appointed senior VP of operations, who joined Apple in 1998 after work at Compaq and IBM.

Product Development

Apple's product development was historically centered at its Cupertino, California headquarters. In 1993 the company built a new R&D campus on the fancifully named street "Infinite Loop". After repeated layoffs, from 1995-1997 the remaining headquarters functions were consolidated into the R&D campus.

Apple had historically spent proportionately more in R&D than rival PC companies such as Compaq, Dell and Gateway. Led by Compaq, these companies had leveraged off of the original IBM PC architecture, which was supported by Microsoft's operating systems. As IBM's relative role in defining the "IBM PC" standard waned, this standard was designed and enforced by Microsoft (and, to a lesser degree, Intel), who laid out detailed specifications for PC makers to follow to assure compatibility.

Since the Macintosh, however, Apple had staked its competitor future on software differentiation, with a budget to match. With the 1993 introduction of Windows NT, the company's crucial requirement became the development of a modern operating system to replace its easy to use (but increasingly unreliable) 1984-vintage Mac OS.

Since February 1997, all software efforts were headed by Avadis Tevanian, Jr., senior VP of software engineering. Tevanian had done his Ph.D. thesis at Carnegie-Mellon on the Mach derivative of the UNIX operating system. He joined NeXT in 1988 to develop Mach as the company's workstation operating system (Williams 1997).

As the next-generation OS was repeatedly delayed, Apple also enhanced other software technologies in hopes of providing differentiation. Among the earliest was its QuickTime system software, which in 1991 became the first PC-based implementation of video and audio. Apple developed Windows-based implementation to broaden its adoption, and continued to enhance QuickTime to meet challenges from Microsoft and Real Networks. To promote QuickTime and Macintosh use, in 1999 Apple introduced two video editing software packages, the professional Final Cut Pro (April) and the consumer iMovie (October).

Apple had also been known at times for hardware innovation, popularizing such ideas as floppy disk, mouse, high-resolution video screens, ubiquitous networking and wireless networking. The same re-organization that brought Tevanian to head software established a new hardware engineering VP, Jonathan Rubinstein, who had led NeXT's hardware engineering until its 1993 exit from making computer hardware. Rubinstein's group also included software engineers to support new hardware technologies, such as the USB, FireWire and AirPort (aka 802.11/Wi-Fi) peripheral connection interfaces.

Rubinstein's efforts, however, were overshadowed in the Jobs II era by those of Apple's product design group, which was led by VP Jonathan Ive. Ive's award-winning efforts included the futuristic "20th Anniversary Macintosh" (1997), the iMac (1998), iBook (1999), the NeXT-reminiscent G4 Cube (2000) and the iPod (2001). One of the major developments came in January 1999, when Apple broadened its iMac line to include five different case colors, introducing the concept of fashion to an industry previously pre-occupied with form.

Both strategically and tactically, Apple's renewed emphasis on design was attributed to Jobs, who executives claimed made major design decisions, just as he had in 1983 with original Macintosh R&D. Jobs emphasized his passion for design in his public interviews:

“I really do think people judge a book by its cover,” says Steve Jobs. ...
“When you see something that’s so thoughtful on the outside you say, ‘Oh, wow, it must be really thoughtful on the inside’,” explains Jobs. “And in our case, they’re right.” (*Newsweek* 2000).

Manufacturing and Operations

The improvement in Apple’s production and operations strategy were a crucial part of its turnaround from its losses in fiscal year 1996 and 1997 to profitable years in 1998-2000. Many attributed these improvements to Tim Cook, Apple’s senior vice president of operations. Cook joined Apple in March 1998 from Compaq, where he briefly served as vice president overseeing its procurement and inventory decisions; before that, he had been chief operating officer of the reseller division of Intelligent Electronics.

Within seven months of Cook’s arrival, Apple had reduced its inventory from 30 days to 6. When asked how they did it, Cook said there was no single factor:

Revamping Apple’s operations took a lot of detail work. Mr. Cook says he met with the CEO of every company that supplied parts for the new consumer iMac Apple launched in August. He also forged tighter relationships with a smaller number of suppliers -- for example, NatSteel Electronics, now manufactures all of Apple’s boards, with plants close to Apple’s factories in Cork, Ireland; Sacramento, California; and Singapore.

Apple’s global operations also provided opportunities for Mr. Cook to save costs. “We were shipping all of our components from Asia to Ireland, and then shipping [some finished PowerBooks] back to Asia. As you can imagine, the costs weren’t so good, and the cycle times weren’t that good.” (Thomas 1998).

One of major changes was (as noted earlier) Apple shifted to outsource manufacturing for all orders except custom build-to-order. Because Apple wasn’t assembling products, it didn’t need to many forms of inventory.⁶ From the first quarter of 1997 to the last quarter of fiscal 1998, Apple’s inventory in purchased parts and work in progress shrunk five-fold. The inventory of finished goods at the end of the 1998 fiscal year reflected a seven-fold improvement over a year earlier (Yang 1998).

One important factor was the product line simplification, which reduced the number of products and also subassemblies — reducing Apple’s desktop computers from four motherboards to one. The use of common components across its product line also improved Apple’s volume and thus bargaining power (Yang 1998). Use of standard industry components such as CD-ROM and disk drives also allowed Apple to leave inventory in supplier warehouses until it was needed (Bartholomew 1999)

The one area where Apple maintained inventory and assembly was on its build-to-order systems.⁷ While this potentially raised inventory costs, it also improved the accuracy of Apple’s forecasts and thus supply chain management by providing an up-to-date window on the latest consumer demand trends (Janes 2000).

Managing both the customized and standard product production and distribution required entirely new supply chain process. In late 1998, Apple adopted the Rhythm sales forecasting system from i2 Technologies, which is also used by Compaq, Dell, Gateway, HP and IBM. In December 1998, Apple adopted a new enterprise-resource-planning system (ERP) based on SAP AG’s R/3; this marked the second attempt by Apple to implement an SAP-based ERP system

— an earlier attempt contracted to Anderson Consulting failed after several years and “tens of millions of dollars” (Bartholomew 1999).

The new systems allowed Apple to tie daily product production to weekly sales forecasts. Apple’s SCM systems also extended to resellers such as CompUSA, allowing Apple to fine-tune its distribution channel to avoid both excess inventory and out-of-stock dealers (Bartholomew 1999; Janes 2000). However, the systems failed to prevent a ballooning on inventory in late 2000, when Apple and other PC makers were late in recognizing that Christmas season consumer purchases would be far below customary levels (Wilcox 2000). The company also suffered from overly optimistic expectations for its new G4 Cube desktop computer.

Sales and Distribution

As the one of the first sizable PC makers, Apple had helped create the PC retail distribution channel in the US during the late 1970s, including chains such as BusinessLand, ComputerLand and Sears Business Centers, and later entrants such as CompUSA. While Apple retained direct sales to K-16 education and some corporate customers, its consumer sales had been and remained through such retailers.

After 1995, these distribution channels posed increasing problems for Apple, both due to pressures across the PC industry and because of Apple’s go-it-alone technology strategy.

Retail Channel

Apple’s declining market share after Windows 95 led to a slow but steady decline in the firm’s relative importance in storefront retail distribution channels. Thus Apple faced declining retail shelf space for its Macintosh computers and related products.

Facing declining share and support, in November 1997 Apple dropped three of its five distributors and in March 1998 phased five of six nationwide retailers, leaving only CompUSA. Two years later, with the success of the iMac and plans for the iBook, Apple added back Circuit City, while strengthening ties to regional retailers such as Fry’s (California) and The Wiz (Mid-Atlantic). Even so, it had only 11,000 outlets as compared to 20,000 at its peak prior to the 1997 cuts (Burrows 2000). One of its largest dealers had been ComputerWare; founded in 1985, in April 2001 the 17-year-old Northern California chain went out of business.

While most the authorized dealers carried a full line of Mac products, the diminishing shelf space for complementary products such as software and peripherals made the Mac less attractive for prospective adopters.

To address this problem, in 1996 Apple began a web page (macsoftware.apple.com) to list 3rd party software (and later other products) for the Mac OS. It also began an advertising campaign to convince Mac buyers to purchase dual-purpose Windows/Macintosh “hybrid” CD-ROMs, which were customarily displayed in the Windows software section where Mac users would be unlikely to find them (“Apple launches” 1996).

Distribution Margins

In response to the rise in the late 1990s of direct PC vendors such as Dell and Gateway, established PC vendors reduced the margins they provided to computer distributors and retailers.

Apple was no exception. With its traditional high-priced, high-differentiation strategy, it had once enjoyed the largest gross margins in the industry. This had allowed it to offer generous margins to dealers to maintain loyalty and provide co-marketing allocations for local advertising. Apple also gave aggressive discounts to key accounts such as education and third party software developers. In the post-Windows 95 crises, Apple was forced to cut costs and prices to remain competitive, and both distribution and key account discounts were gut drastically.

In 1997, Apple tightened distribution policies even further. In anticipation of the launch of its direct retail web site, in September 1997 Apple had announced new dealer policies (effective December 1997) that allowed smaller retailers to buy product directly from Apple (eliminating distributor mark-up) and also adding a four-week price protection policy. At the same time, it restricted product returns and reduced its co-marketing allowance to 0.5% of product purchases (Apple Computer 1997a).

Retail Stores

Apple's direct retail web site helped address its lack of shelf space and mindshare in the traditional retail channel. But convinced that was not enough, Apple in 1999 also began hiring veteran retail executives from Sony, Target and Gap. In planning its own brick-and-mortar stores it had the precedent of Gateway 2000, which opened its first store in late 1996 and which were held critical to its ability to provide high-margin services such as training and repair (Tam and McWilliams 2000).

In May 2001, Apple finally confirmed its long-rumored plans to open its own stores, with its first stores in affluent D.C. and Los Angeles suburbs. However, unlike Gateway — which by then operated 300 stand-alone stores in low-cost suburban strip malls, Apple planned a more limited presence in upscale shopping malls (Richtel 2001; Tam 2001). Apple initially forecast 25 stores by the end of 2001. At the end of its fiscal year in September 2002, it had opened 41 stores, and expected 50 stores by the end of 2002.

The two chains also differed in their retailing format. The Gateway format emphasized hands-on consumer access to Gateway products with a limited selection of supplemental products. The Apple stores were a more direct extension of Apple's strong brand image, with "experiential" marketing akin to a fashion-oriented clothing retailer such as Gap.⁸

4. Internet and E-Commerce

The wide reach of the Internet was ideally suited for Apple's resurgence. The wide dispersion of Macintosh users throughout the U.S. (and the world) were large enough to make a sizable market, but difficult to reach cost-effectively through conventional distribution and information channels.

The same factor applied to both computers, and accessory products such as software, peripherals, cables and manuals. The Internet also provided a source for Macintosh-related information, as the Mac's declining share (if not absolute numbers) made it harder to support the software of magazines and books that had supported hobbyists and corporate IT experts since the PC was invented in 1975.

The shift to the Internet was also tied to the Internet capabilities of its three key market segments in the mid-1990s. In its core market of U.S. education, universities had among the highest Internet penetration in the world, while in K-12 Internet access was almost non-existent. Meanwhile, its other major segment, desktop publishing designers, began to shift to a new design market (web publishing) that was inherently tied to the Internet.

Sales and Marketing

Catalog Vendors Shift to the Web

With the lack of retail shelf space, Macintosh users became highly dependent on so-called "mail order" retailers, which published catalogs mailed monthly to customers and prospective customers to generate sales (and next-day delivery) via toll free call centers. Demand for these

catalogs was fueled by the explosion of computer products, as well as demand from suburban and rural locations not well served by existing retailers.

These direct marketing companies began in the mid-1980s with ads in the back of computer magazines, and developed catalogs in the late 1980s. From 1990 onward, they were one of the two rapidly-growing distribution channel for PC software and accessories (along with “superstore” retailers) until the emergence of online sales in 1995 (Table x). Given their cost of acquiring customers, they concentrated on those customers that generate repeat sales — mainly small and medium-sized businesses ignored by the direct sales forces of hardware and software producers.

Table 2: Leading PC industry catalog sellers/e-tailers in U.S.

<u>Company</u>	<u>Mac Brand</u>	<u>IPO</u>	<u>Date Begun</u>	<u>First catalog</u>	<u>First Mac sales</u>	<u>First web sales</u>	<u>1999 revenues (\$ mil.)</u>
CDW Computer Centers, Inc.	CDW	May 1993	1984	1987		1995	2,561.2
Micro Warehouse Inc.	MacWarehouse	Dec. 1992	1987	1987	1987	?	2,243.0
Insight Enterprises	<i>none</i>	Jan. 1995	1986	?	N/A	?	1,518.4
PC Connection, Inc.	MacConnection	Mar 1998	1982	1990	?	?	1,056.7
Creative Computers, Inc.§	MacMall	April 1995	1987	1994	1987	?	732.0
Multiple Zones International	MacZone	June 1996	1988	1990	1988	1995 3/1997†	487.4

* Previously a NASDAQ listed company, taken private in Feb. 2000 LBO

† Relaunch

§ In June 2000, it changed its name to IdeaMall, Inc.

Due to lack of shelf space for Macintosh-related products, Apple was proportionately far more dependent on mail-order retailers for distribution than the Windows segment of the PC industry. At the time of Apple’s post-Windows 95 decline, the dependence was mutual for companies such as Micro Warehouse and Multiple Zones, which had begun in the 1980s as Macintosh-only catalogs. In 1995, the Apple-related products were responsible for the majority of sales for both Micro Warehouse and Multiple Zones, which led to financial troubles for both firms as Apple’s share declined from its 1994 peak.

Analyst and company executives both recognized the shift in Apple’s fortunes. For example, in mid-1996, the CEO of Multiple Zones said:

“It was clear that while the Mac audience was more direct mail responsive than the PC/Windows audience, it was becoming a slow-growth segment. ... But the PC platform was unfathomably huge and growing quickly. So our growth challenge was to acclimate our business model to the needs of the PC customer.”
(Kiley 1996)

Beginning in 1995, the major catalog vendors opened online stores for personal computers, software and accessories. Originally crude “brochureware” with less information than the printed catalog, they gradually evolved to more information than the physical catalog, with sophisticated searching, a greater variety of products, and up-to-date pricing and availability. In parallel with direct PC sellers such as Dell Computer (Kraemer et al. 2000), these catalog web sites began the shift of PC industry purchases from storefronts and 800 numbers to the web.

According to Apple management, the catalog vendors played both a competing and complementary role to Apple's own direct strategy (Janes 2000). With their customer databases and centralized inventory they were ideally suited to serve a niche market like the Macintosh, capturing the most knowledgeable (and profitable) customers from the limited product lines available in retail stores. The Internet brought efficiency improvements by reducing the demand for printing and postage and simplifying ordering and fulfillment. At the same time, the catalog websites were the most threatened by Apple's own shift to direct online sales.

Apple's Direct Online Sales

Given the Apple's niche strategy and difficulties with retail distribution, long before Apple deployed its online store, there were many who believed that it would be ideal for online sales. For starters, in 1996 Macintosh users were twice as likely as Windows users to connect to the Internet (Lewis 1996).

With the shrinking physical shelf space and online sales by third-party catalogs, many considered Apple's web-based sales to be a matter of when rather than if. Four months after Jobs assumed effective control of Apple, on November 10, 1997, it unveiled an updated web site with online purchasing support for U.S. customers.

Apple's initial strategy and tactics for the online sales focused on a nominal rivalry with Dell Computer, which had begun its own online sales in early 1996. Reportedly upset by Michael Dell's comment that Apple should be liquidated, Jobs exchanged e-mails with the rival CEO. At the Apple Store introduction, Jobs took time to label the remark "rude" and unveiled a bulls-eye target with Dell's face superimposed. Jobs and the former NeXT staffers also had to watch as Dell dismantled one of the showcase installations for NeXT's WebObjects software product, as it replaced it with a proprietary Microsoft-based system (Burrows 1997; Miller 1997).

Apple's use of Dell as an exemplar and competitor glossed over a crucial difference between the two companies. Since its 1984 founding, Dell had (with one notably brief and unsuccessful exception) sold its products directly to end-users. Meanwhile, Apple had almost entirely sold its products through the traditional two-tier PC distribution channel — a channel that was developed in response to the 1977 Apple II and later utilized by IBM, Compaq and others.

In a statement issued to publicize the launch of Apple's web site, Jobs sought to position it as being complementary to its existing channel:

Apple's Internet commerce efforts are designed to address customer demand to buy directly from Apple and to be able to order specific configurations. It is not a way to compete with our current distribution channels, but a means to complement them. The Apple Store will be a neutral proposition as far as pricing and product allocation is concerned (Apple Computer 1997b).

Through ease of use and other aspects of the online shopping experience, Apple also sought to use the store as a role model to improve the standard for its other dealers (Janes 2000).

To reduce channel conflict and maximize profits, Apple's online prices exactly matched its list prices — list prices that after dealer margins reductions had become the actual "street" prices. However, the store effectively offered a better price for users who wanted a non-standard configuration (such as a larger hard disk), because they could mix-and-max options to purchase just the options they were interested in. At the same time, reducing the number of configurations available in the channel and selling custom configurations directly allowed it to avoid the inventory problems that had plagued it throughout the early 1990s. As one industry analyst

commented, “They have been horrible at forecasting for a long time. ... The direct model is more effective because you know what customers have bought and there is no inventory.”

The store proved effective in dealing with spikes of pent-up demand at peak periods. The store logged \$500,000 in the first 12 hours. In May 1998, when Apple released its long-awaited update to its PowerBook laptop computer, it recorded a record \$1.9 million in one day. On the same day, a new direct store for education buyers recorded an additional \$1 million in sales.

Table 3: Milestones in Apple direct online retailing

<u>Date</u>	<u>Event</u>
mid-1994	Apple launches first web site
Nov. 1997	Apple Store (U.S.) opens; first build-to-order fulfillment
May 1998	Apple Store opens in U.K.
Aug. 1998	Apple offers built-to-order for U.S. resellers
Sept. 1998	Apple Sweden opens online store
Jan. 1999	Apple Store in Europe opens for France, Germany, Italy, Spain, Belgium, Netherlands
	Apple Australia opens online store
Feb. 1999	Apple Japan opens online store
March 1999	Apple Store in Europe adds Austria and Switzerland
Oct. 1999	Apple Hong Kong opens online store
Feb. 2000	Apple Canada online store opens
Oct. 2000	Apple ends online store’s exclusive rights to some CPU configurations
May 2001	Apple opens first retail stores in U.S.

With its product differentiation and unique market position, Apple worried less about channel conflict than other traditional PC makers (such as HP or Compaq) whose dealers could easily shift to another “Wintel” supplier if they became angry. Apple’s online store initially enjoyed certain exclusive products and configurations not available to retailers or other online stores. But partly in response to dealer complaints, Apple ended such exclusives in October 2000. The shift — prompted by declining sales that would soon engulf the entire industry — was not enough to prevent Apple’s first quarterly loss in more than two years.

After launching its first online store in the U.S. in 1997, over the next three years Apple spread its online store to major markets overseas (Table 3). Finally, in May 2001 Apple expanded its direct retail operations to include company-operated stores in upscale shopping malls.

Internet-related Products/Services

As the only PC maker that is also an OS vendor, Apple pursued a series of e-services initiatives that were more directly comparable to its rival Microsoft than to other PC vendors.

From 1985 onward, it developed a series of proprietary online services for communicating with its distribution channel and later key partners and customers. It later pursued two abortive efforts to establish proprietary online services for consumers, one of which became a rival service and the other ended when Apple acceded to the ascendance of the world wide web.

Apple extended to its web site its unique strategy of software-based differentiation. By and large, the services were more successful in retaining already-loyal Macintosh users than in making converts among Windows (or new) users — who would rarely hear about developments in Apple’s world. It also developed a series of technologies that combined OS enhancements with online services, while (like Microsoft) developing Windows-based clients for those technologies that it needed to maintain as cross-platform standards.

Proprietary Online Service Efforts

Both major vendors of proprietary PC operating systems — Microsoft and Apple — used their OS as a natural springboard for offering proprietary online services. Microsoft was ultimately more successful by bundling access to MSN beginning in August 1995 with Windows 95. But during the 1980s, the then-larger Apple developed and refined key online service concepts that it and others would later translate to the World Wide Web.

In 1985, Apple made its first foray into online services when it announced AppleLink (Table 4). Operating using a network owned by General Electric Information Services Co., it was aimed at supporting its dealers, distributors and internal sales force. The graphical user interface set new standards for ease of use in online services, which up to that point had been designed for text-oriented terminals and terminal emulators.

Table 4: Apple proprietary online service milestones

<u>Date</u>	<u>Event</u>
Jan. 1985	Apple announces AppleLink service to communicate with dealers and its field sales force
1986-88	AppleLink access is broadened to include value-added resellers, third-party software, hardware developers and major accounts
May 1988	Apple signs agreement with Quantum Computer Services to jointly develop AppleLink Personal Edition
Sept. 1989	After Quantum announces plans for MS-DOS client, Apple cancels support for joint venture
Oct. 1989	Quantum debuts America Online service with Apple II and Macintosh client software
Jan. 1994	Apple CEO Michael Spindler announces eWorld, its consumer-oriented proprietary online service
June 1994	eWorld switches from beta to commercial mode for U.S. users
Sept. 1994	eWorld available outside U.S.
Aug. 1995	Microsoft launches MSN with intro of Windows 95
Jan. 1995	Apple cuts eWorld access charges by 50%, announces plan for Windows client software
July 1995	New eWorld client software allows users to browse web sites
Sept. 1995	Apple announces shift in emphasis to the Internet, strengthening web sites and shifting eWorld from proprietary technologies
March 1996	eWorld is shut down
March 1997	AppleLink is shut down

While the service was strategic for Apple, the online revenues were entirely enjoyed by GE. To broaden both its reach and control, in 1988 Apple signed an agreement with the fledgling Quantum Computer Services to develop AppleLink Personal Edition. The next year, the two parties disagreed over the direction of the venture and the deal was called off. Lacking use of the Apple trademark, Quantum renamed the new service “America Online” (*MacWEEK* 1989; Alsop 1997). Apple retained a 5% stake in America Online.

More than four years later, in 1994 Apple announced and deployed its own online service, eWorld, but the service was too little too late and was closed in March 1996. Apple closed its AppleLink service the following year.

iTools and Internet

In January 2000, Apple unveiled a major Internet services initiative. Unlike in its eWorld or AppleLink days, it was no longer trying to provide access, but instead to provide content to boost the loyalty of its PC customers. As CEO Steve Jobs explained:

The more I thought about it, the more I saw that you can separate services from Internet access, and use those unique services to create incredible competitive differentiation, regardless of who provides the access. We didn't have to be an access provider ourselves to get most of the benefits (*Fortune* 2000).

The major thrust of its announcements was “iTools,” a package of free web-based services accessible off the Apple web site. These included “mac.com” domain e-mail, a child-filtering content service, a remotely hosted disk archival/sharing service, and web page authoring service. All won praise for their ease of use.

As with eWorld, iTools marked an attempt to offer a nicer interface for commonly available services, but without the revenues. The services offered some potential revenues for Apple, since most users required a \$99 upgrade to the current Mac OS 9, and additional disk storage on Apple's servers beyond the minimum brought an additional charge. But the main focus was to extend Apple's differentiation on ease of use into common Internet services.

Also in January 2000, Apple invested \$200 million in Earthlink and designated it its preferred Internet service provider. While the simplification of its Internet access messages offered minor ease of use benefits, the major objective was to steer all Mac users to ISP where Apple held a financial investment and from which it received a referral fee. With the switch, Apple discontinued bundling of America Online access software on its new CPUs, although it continued to distribute both Microsoft and Netscape browser and e-mail software.

In July 2002, Apple rechristened its free iTools services “.Mac” — a direct response to Microsoft's .NET. The repositioning also shifted the services from free to a \$99/year paid service. The new charges brought complaints and outrage from loyal Macintosh supports used to the earlier free services. At October 1, 2002 deadline for switching to the paid service, Apple announced that it had attracted 186,000 subscribers (versus 3 million PCs sold each year) and extended the deadline.

Support

Like other I.T. industry firms, Apple soon discovered the power of the Internet to reduce support costs, both in terms of distributed general purpose one-to-many updates and also by providing a single, indexed online repository that could be selectively retrieved to solve particular problems. The timing proved fortuitous, with the creation of web browsers and other steps in

Internet adoption in the mid-1990s coming exactly as Apple faced pressures to reduce costs through layoffs and any other means.

Apple had developed some support content and strategies for its AppleLink and eWorld proprietary online services. However, hypertext web pages provided a more natural way to organize and link information. At the same time, the greater bandwidth available to corporate Internet users (when compared to dial-up online services) made practical online distribution of sizable software updates.

Third-party Developers

As the owner of its own proprietary system architecture, Apple faced an imperative unique among PC makers (though analogous to Microsoft) to market and educate third-party developers of complementary assets such as application software and peripherals. The 1990s brought an eventual shift of most such efforts from snail mail to e-mail and the web.

With its introduction of the Macintosh in 1984, Apple had faced the daunting challenge of attracting an entirely new class of application software, that based around graphical user interfaces. It created a group of account managers to attract and motivate third-party independent software vendors (ISVs) to write this new software; they held the whimsical title “evangelist”. Three years later, when it released two expandable, open architecture hardware designs, it also deployed a smaller number of account managers for independent hardware vendors (IHVs).

Initially, to focus its limited resources, Apple had a single class of “certified developer” which were authorized to receive nonpublic development information and have direct access to its evangelist group. In 1989, Apple replaced the free certified developer program with a \$600/year “Partner” program. At the same time, it provided a second “Associate” tier of support, which had less stringent entrance requirements and was more broadly targeted to smaller developers as well as in-house corporate programmers (West 1989). As part of the new programs and its strategic shift, Apple broadened its ISV/IHV support and evangelism focus to include a larger number of developers in hopes of maximizing its complementary assets.

During its life-threatening crises and associated reorganizations from 1996-1996, Apple made deep cuts in ISV/IHV spending. In April 1998, it unveiled a new developer program with three tiers of support: Premier (\$3,500 annually), Select (\$500) and Online (free); later that year it added a \$99 student service level, aimed at attracting budding programmers. All of the paid programs included monthly mailings, but even the free service included access to technical information on the Apple web site (Crabb 1998).

The 1998 revision consolidated all of Apple’s online information in one section of the company’s web site, dubbed the “Apple Developer Connection”. The password-protected site supplanted previous administrative duties handled by mail and telephone, such as member changes of addresses and annual renewals. However, the main attraction of the site was a comprehensive database of technical information

Timeliness was a crucial goal of supporting third party developers, since Apple hoped to have them support new hardware and software technologies simultaneous with their release to end users. Thus a major requirement was in distributed technical information and beta software in advance of release; in the physical world, such distributions had been targeted at elite tier developers to save mailing costs.

In 1997, Apple started a program to distribute such information via encrypted file archives on its FTP site. By 1999, developers were downloading 100+ Mb operating system updates, taxing servers and data networks on the days the releases were announced. Later that year, Apple integrated confidential downloads directly into its password-protected developer web site. The

developer site also included online bug reporting for developers to electronically file problems that they had identified with Apple operating system software.

As a cost-cutting measure, Apple also shifted its developer communications from paper-based mailings to electronic mail. In 1996 Apple instituted a weekly developer e-mailing and the next year discontinued its paper-based newsletter.

Finally, the web site served as a front-end for Apple's "open source" strategy. In March 1999, Apple announced plans to provide public access and collaborative development for "Darwin", a derivative of the Mach and FreeBSD operating systems that formed the core of the NeXT OS and its upcoming Mac OS X. A section of the Apple web site provided notices to collaborative development between developers of the Darwin OS and later for its QuickTime streaming software. Developers had complete access to the latest released version of this source code (which excluded Apple's GUI) using the TCP/IP-based source code control tool CVS.

In the end, the Internet resolved Apple's long-standing dilemma over the scope of its developer efforts by allowing it achieve both reach and focus. Web pages and e-mail enabled it to reach the broadest possible audience of developers and potential developers at little marginal cost. Meanwhile, the human beings in Apple's Worldwide Developer Relations group espoused a mission "to build and manage partnerships with the focused group of developers worldwide that drive Apple's success in our strategic markets."

End Users

The online database of support advice for end-users evolved out of the information originally posted for dealers and developers to AppleLink and later to the web. At the same time, they supplemented the more expensive to provide one-on-one telephone technical support, which Apple gradually shifted to a fee-for-service basis.

The offerings eventually included:

- Tech Info Library (TIL), a database of short tech support articles,
- Software Updates, online downloads of free software
- Apple Spec database, with specifications of current and past products
- Online manuals
- Moderated online discussions

This information was presented in the "Support" section of the Apple web site.

By 1993, Apple had published some of its software updates on the Internet to its dedicated FTP site (Ford 1994). Beginning in July 1994, Apple took the support information already published on AppleLink and eWorld and extended it to CompuServe and the Internet; the latter was accessed via "Gopher" text-based data browser. This information included the TIL, software library and product specifications (Apple 1994). By the following year, Apple had published the TIL in HTML format, although the Internet information initially only included a small subset of the AppleLink and CD-ROM databases (Ford 1995).

While AppleLink and CD-ROM services were available to a select few, the rise of the Internet made these databases widely to available to most customers and facilitated its transition away such costly human-mediated services. Meanwhile, the online support enabled Apple from costly telephone support to the web (which had little marginal cost).

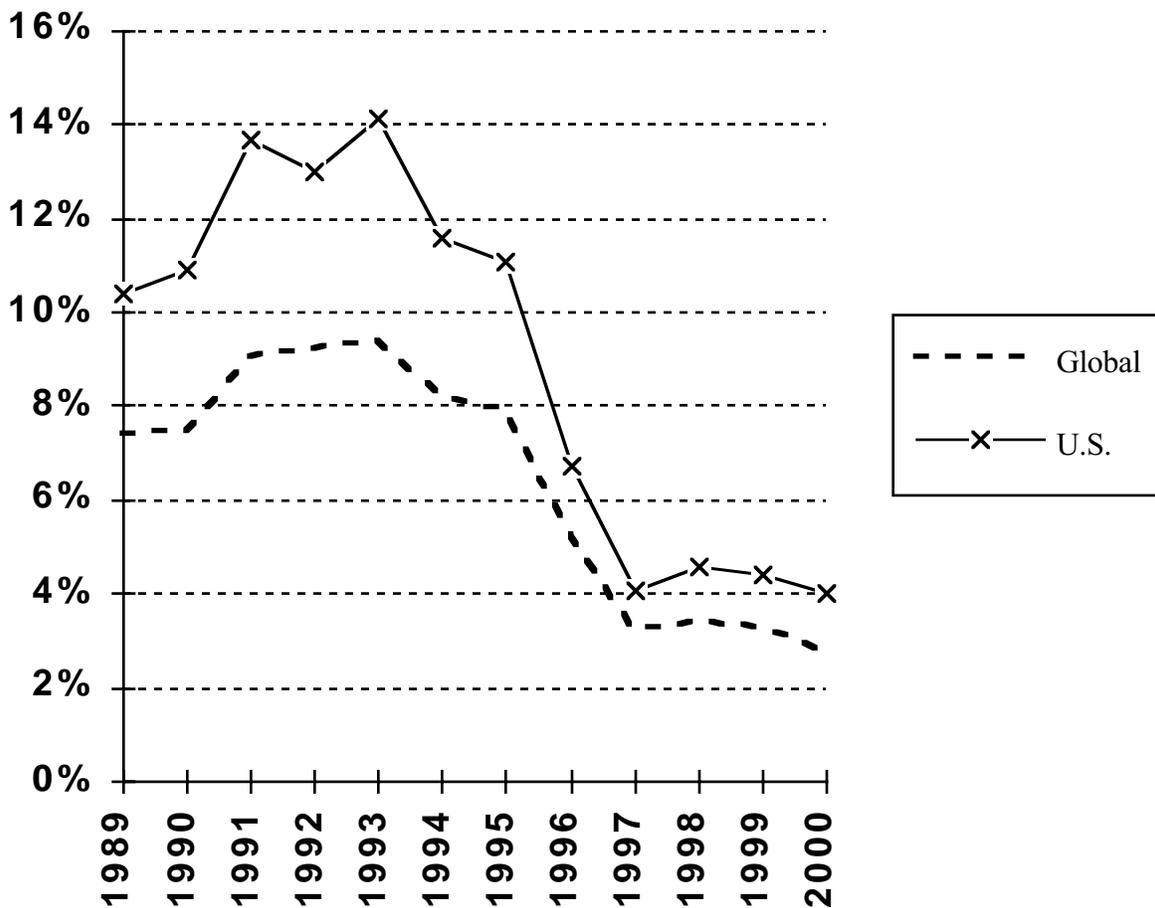
Despite sporadic user complaints about tech support quality and timeliness, Apple's shift to the web enabled it to provide better support at a lower cost. In Fall 2000, Apple's support quality surpassed that of 13 rival PC makers in a survey of 25,000 ZDNet readers. Apple shared a "Support Star" award with Dell, tying Dell for best telephone support and besting Dell and others in web site ease of use and overall support satisfaction (Dittamore and Vamosi 2000).

5. Company Performance

Revenues and Market share

Facing increased competition from Windows-based computers, Apple's global market share peaked in 1993, and revenues peaked in 1995. The next two years marked a period of difficult retrenchment, including losses totaling nearly \$2 billion and a \$375 million special charge in fiscal year 1997 for writing off R&D that would never be used. After dropping from their peak, market share (both globally and domestically) leveled off from 1997-2000 (Figure 1).

Figure 1: Domestic and global market share, 1989-2000



Source: West (2000) based on Dataquest reports

Revenues and profits improved in fiscal year 1999 and 2000 (Table 5). In 1998, the company restored its gross margins (sales less cost of goods) and once recorded quarterly and fiscal year profits; the year also marked the bottom of its sales slide. The August 1998 shipment of the first iMac helped fuel an increase in sales units and revenues beginning the fiscal year 1999, a trend that continued into the following year.

Table 5: Key financial indicators, 1995-2001

	1995	1996	1997	1998	1999	2000	2001
Revenue	\$11,062	9,833	7,081	5,941	6,134	7,983	5,363
Growth	20.4%	-11.1%	-28.0%	-16.1%	3.2%	30.1%	-32.8%
R&D	\$614	604	485	303	314	380	
Net income	\$424	-816	-1,045	309	601	786	-25
Gross margin	25.8%	9.8%	19.3%	24.9%	27.6%	27.1%	23.0%
SG&A %	14.3%	15.9%	18.2%	15.3%	16.2%	14.6%	21.2%
R&D intensity	5.6%	6.1%	6.8%	5.1%	5.1%	4.8%	8.0%
Operating margin†	6.0%	-12.2%	-5.7%	4.5%	6.3%	7.8%	-6.2%
Net profit margin	3.8%	-8.3%	-14.8%	5.2%	9.8%	9.8%	-0.5%
Employees	13,191	10,896	8,437	6,658	6,960	8,568	9,603
Sales/employee	\$839	902	839	892	881	932	558

Source: Company 10-K statements, for fiscal years ending September 30

All \$ figures in millions, except sales/employee (thousands)

† Before special charges

However, in the 2nd half of calendar year 2000 — the final quarter of FY2000 and the first quarter of FY2001 — sales tumbled. Some of the decreased sales were attributable to poor sales of Apple's newest product, the G4 Cube. Analysts had praised the product's industrial design as a "showstopper" and some even predicted it would improve sales (e.g. Burrows 2000). But instead, most buyers were disappointed with the high price, lack of expandability and quality problems on the case's appearance. Apple later admitted that sales were two-third less than expected (Fried 2001).

Apple's September 2000 profit warning, however, presaged a larger trend in the global PC industry. Some PC firms (with the notable exception of Dell) experienced sales declines during late 2000 and early 2001. By mid-2001, research analyst firm IDC predicted U.S. PC unit sales would be lower in 2001 than 2000, the first year-on-year decline recorded since the industry's beginnings in the 1970s.

Throughout the early 1990s, Apple had shown consistently higher gross margins than its PC industry competitors. However, from this, it had to fund a much higher R&D intensity than its rivals, typically 6-8% as compared to 1% for most other PC companies.⁹ Both figures were attributable to Apple's role as the design of its system architecture, a role that the remaining PC makers largely relied on Microsoft to fulfill. However, its recovery required focus on its core PC systems business and abandoning efforts to set standards in handheld computers, set-top boxes and other segments. From 1996-1998, R&D spending fell by nearly half, and the R&D intensity in 2000 dropped below 5%.

Table 6: Performance comparison of leading PC makers, 1999

	Gateway	Dell	Apple	Compaq†	PC Industry
<i>Profitability</i>					
Gross profit margin	22.0	20.7	28.0	22.7	23.9
SG&A as % of revenues	15.1	9.4	16.0	16.5	N/A
R&D intensity (%)	<1	1.5	5.0	4.3	N/A
Operating margin (%)	6.9	9.0	5.8	1.6	N/A
Net profit margin (%)	5.2	6.6	9.7	1.4	4.1
Return on equity	23.0	31.4	17.1	4.1	12.7
Return on assets	11.7	14.5	9.6	2.2	6.7
<i>Operating Ratios</i>					
Inventory turnover	36.8	59.9	243.2	14.2	24.2
Asset turnover	2.5	2.8	1.2	1.5	1.9
<i>Growth rates</i>					
12-month revenue growth (%)	13.2	38.5	15.9	10.7	19.9
12-month net income growth (%)	25.5	14.1	47.8	n/m	n/m
36-month revenue growth (%)	16.0	48.2	-4.6	23.9	21.8
36-month net income growth (%)	32.7	47.2	n/m	n/m	n/m

† Includes former DEC and Tandem businesses, and so is not directly comparable to pure PC makers.

N/A: not available

n/m: not meaningful

Sources: Kraemer et al (2000), abstracted from company reports and Hoovers Online

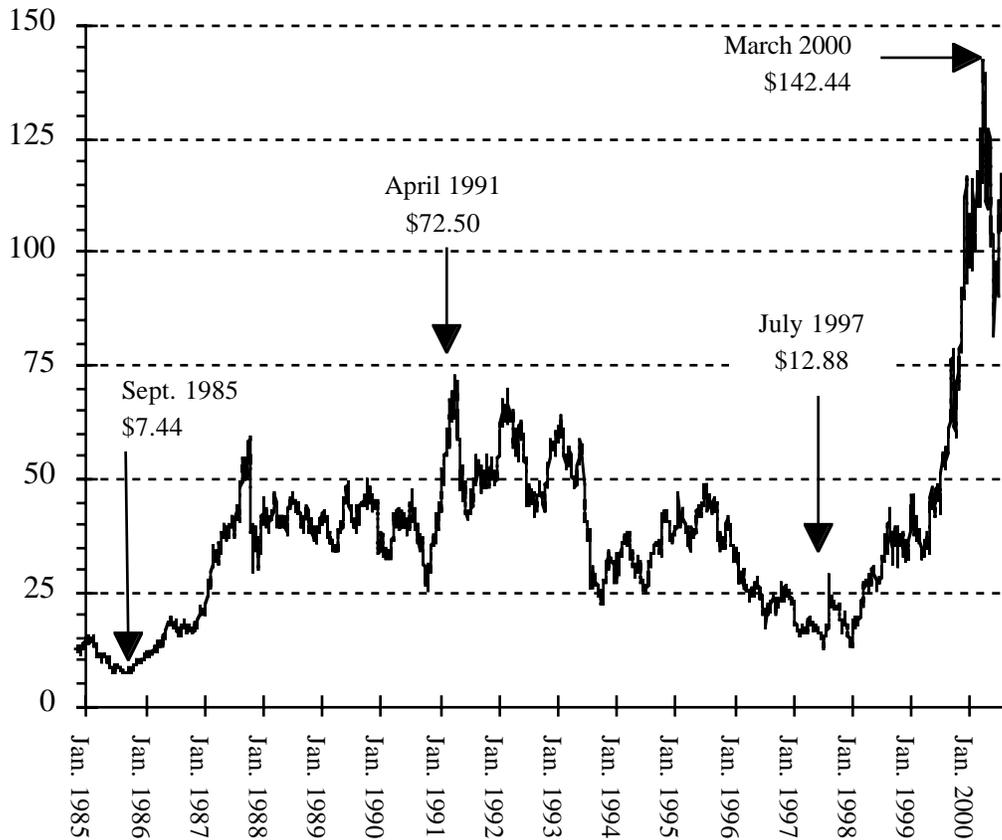
Financial Performance

As shown in Figure 2, Apple's stock price rose (with some backsliding) continuously from September 1985 to March 1991. From then on, it see-sawed until the nadir of the company's profit and viability crisis, the losses reported in July 1997 that led to the resignation of CEO Gil Amelio. At that point, the stock closed below \$26/share. With the ascension of Steve Jobs and the associated improvements in operations and execution, the stock rose steadily to an all-time high in March 2000 above \$280, and the stock was split 2:1 two months later.

However, with the rest of the NASDAQ the March 2000 figure marked the final peak of the .com speculative run-up. Whatever hope Apple's stock had of recovering ended on September 28, 2000 when Apple's profit warning cut the price in half. In the face of slumping industry demand and declining company revenues, over the next two years the stock bounced back and forth between \$15 and \$25 per share (post split).

In October 2002, the company's stock was trading at around \$14 per share, despite having \$10 per share in cash. For other firms, such a discount to liquid assets reflected serious concerns about their ability to cover long-term debts and remain a going enterprise. However, leading analysts suggested that Apple's plight was similar to those of other high-technology companies where the earlier investor technology mania had been supplanted by a comparable technology phobia (Tam 2002).

Figure 2: Cumulative financial performance, Apple stock, 1985-2000



Source: Financialweb.com, as reported by West (2000)

Notes:

1. Closing price in U.S. \$
2. Excludes dividend paid from April 1987-December 1995
3. Actual price is twice that shown after 6/21/00 stock split

6. Conclusions

Once one of the largest firms in the PC industry, Apple throughout the 1980s had been the industry's leading innovator. Among its many innovations were distributing content via its proprietary online service to reach its sales channel, third-party developers and key accounts in large organizations. Such content and expertise naturally migrated to the Internet during the 1990s, delayed only briefly by an ill-timed expansion of its proprietary online services.

But by the time the Internet emerged as a viable e-commerce platform, Apple faced far more pressing problems. The rise of Windows and Apple's failure to innovate meant that it had lost the differentiation which had supported its entire high-profit, high-cost business model. Apple also had made many strategic and operational mistakes which compounded its problems. The resulting loss of market share and financial pressures forced out three CEOs in four years.

These pressures forced drastic changes in the corporate goals and strategy. Apple cut expenses any way it could, including both productive and unproductive R&D. Accepting the inevitable, it simplified its product line and focused on a smaller number of targets.

At the same time, around 1995 Apple began a classic case of business process re-engineering. After a few false starts, it shifted to standardized components, reduced inventory and outsourced manufacturing. With the return of CEO Steve Jobs, it set a specific goal of matching or exceeding Dell Computer in key operational metrics.

Such improved operational efficiency laid the groundwork for Apple to develop an online retailing system, which debuted in the U.S. market in November 1997 and was deployed worldwide in 1998 and 1999. As with other PC companies such as Dell and Gateway (Dedrick et al 2001; Kraemer & Dedrick 2001), Apple's e-commerce sites were used to reach existing market segments and offer them a wider array of configuration options.

E-commerce also enabled Apple to address challenges not faced by other PC firms. Like some PC firms like HP and Compaq, Apple historically received most of its sales from a multi-layered retail-oriented channel. For these companies — unlike Dell and Gateway — deploying direct e-commerce web sites posed inherent risks of alienating the existing sales channel and potentially even causing a net reduction in sales.

However, Apple faced its own unique channel problems. As the only PC maker outside the “Wintel” ecosystem, it required its own co-specialized complementary assets such as software, peripherals and training (Teece 1986). With Apple's U.S. market share fluctuating around 4% since 1997, distributing such products became uneconomic in all but the largest metropolitan areas. Online B2C retailing — both Apple's and those of third parties — provided a way to distribute a complete range of complementary products to its customers. So whether by design or of necessity, Apple is shifting its sales from indirect to direct channels, both online and through its own retail stores. The shift could easily become a self-fulfilling prophesy, if by competing with its sales channel Apple accelerates the death or abandonment of its dealers.

In the end, on operational matters Apple conformed best practice of the PC industry, becoming increasingly direct with strong online commerce (matching Dell) and its own retail stores (as with Gateway). At the same time, it has sought to recapture its previous reputation for innovativeness and announced a goal to grow its sales relative to its competitors.

Apple's e-commerce strategies thus provide a textbook example of how companies in niche markets can effectively reach a geographically dispersed customer base. And as with Dell, they show why online sales and support are crucial to controlling and improving the customer experience in a way that's inherently impossible through indirect channels. At the same time, Apple's successful use of e-commerce may not be representative of other indirect PC vendors, who face far higher risks from channel conflict than does Apple.

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8. Endnotes

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- ¹ In Japan, NEC and other PC makers originally developed modified versions of the IBM PC architecture to support Japanese characters, but by 1997 all had shifted to a software-based solution which used unmodified PC-compatible hardware (West & Dedrick 2000).
 - ² This section is adapted from West (2000, 2001).
 - ³ R&D intensity comparisons with full-line computer makers such as Compaq, Fujitsu, Hewlett-Packard, IBM and NEC are misleading since they maintain expensive R&D efforts for high-margin proprietary systems.
 - ⁴ Beginning with its 1997 fiscal year, Jobs discontinued Apple's glossy annual report as a symbolic cost-saving measure. Despite renewed profitability, Apple still limits its annual filings to 10-K statements filed electronically with the U.S. Securities and Exchange Commission.
 - ⁵ At the same time, Apple also sold its Napa, Calif. data center to MCI Systemhouse and entered into an outsourcing agreement.
 - ⁶ In fact, the dramatic drop in inventory levels is partially an artifact of how inventory is recorded under generally accepted accounting principles. Such inventory only measures product or components owned by a manufacturer such as Apple, not all product in the value chain — even if the manufacturing has to indemnify its suppliers and distribution channel. Apple has reduced its liabilities for such products but it is unlikely eliminate them entirely.
 - ⁷ Apple internally refers to these systems as “configure to order,” and uses the customary industry terminology “build to order” to refer to standard configurations that are assembled on-demand at outsource vendors.
 - ⁸ In 1999, Apple CEO Steve Jobs and Gap CEO Mickey Drexler joined each other's respective board of directors. Apple also hired the same store construction firm as the Gap, Fisher Development, which was run by the brother of GAP founder and chairman Donald Fisher (Robson 2001).
 - ⁹ By comparison, in its fiscal year ending June 30, 2000, the software-only Microsoft Corporation reported gross margins of 86.9% and R&D intensity of 16.4%.