CHAPTER ONE

# Reversals of Fortune

It was a warm, breezy day in the early summer of 1994 as I drove south on Middlefield Road in Mountain View, California, on my way to a new startup named Mosaic Communications, Inc. I had arranged to meet some old Apple Computer friends who had bailed out of Apple to join the new company only a few days earlier. My nethead friends were overly enamored, for my tastes, with the recently commercialized ARPANet, now becoming the Internet. In fact, Apple Computer hadn't paid much attention to their Internet dreams, so they left. Apple was never going to care about networks, so why not move to a networking company? Even I thought the "Internet business" was far too techie for consumers. But when my friends were offered stock options to play with the Internet, they bolted.

I thought my friends crazy for jumping the Apple Computer ship to swim with an unknown startup. After all, Apple Computer was going strong, growing its worldwide share of the personal computer market to nearly 10 percent, making it second only to all-powerful IBM. The personal computer market was up for grabs as nobody had more than 11–12 percent of the blooming global market. Things could only get better for Apple. Mosaic could be gone in 6 months.

A classic rock station blasted from my radio as I waited for a red stoplight to turn. The emblem of a polished horse glistened from the car next to me. These Ferrari's are a dime a dozen in Silicon Valley, I thought. They are usually the first things a software engineer buys when his or her stock options mature. It is a common story. First, a college grad takes any old job long enough to get a foot in the door. Then he or she works 80 hours per week, makes a mark, and quits to join a startup! Visions of fat stock options dance in the youngster's head. I was jarred back to reality when the Ferrari roared off into the distance—layering

more dust onto my grimy Ford Bronco. My Mosaic friends, you see, were seeking their own Ferrari's. So much for corporate loyalty in Silicon Valley.

Life was good in the summer of 1994. Venture capitalists poured $5.3 billion into 1,036 startups and second round companies. Most of the money went into network equipment companies. Mosaic Communications seemed to be at the right place at the right time. In the case of Mosaic, the return was fantastic. A year later, the startup would change its name to Netscape Communications, and the VC moneymen would cash out at IPO time to the tune of $2.8 billion. Not bad for a company that was worthless 15 months earlier. I didn't know this, however, as I made my way to the front door. But I was fully aware that this is the way the Valley works.

Silicon Valley commands a 37 percent market share of all U.S. hi-tech businesses. With $500 billion in market value, Valley companies employ nearly 15 percent of all computer-related workers in the U.S. Hollywood controls 55 percent of the U.S. entertainment business, for example, but its market value is only $50 billion—one-tenth that of Silicon Valley's. Detroit's auto industry is approximately $100 billion (64 percent market share), New York controls 26 percent of the financial services market, but it still falls $100 billion short of Silicon Valley's valuation! Nestled almost entirely within Santa Clara County, ground zero of Silicon Valley is an economic powerhouse. I pondered the chicken-and-egg question, "Does greed chase after money, or does money come soon after the onset of greed?"

My turncoat friends escorted me into the cafeteria where we spent the next hour catching up and discussing why they had left the plush Apple campus for this scrappy startup. It wasn't the money they declared—it was the challenge. They were eager to knock off Microsoft. They had failed to kill Microsoft while at Apple, so Mosaic was their second chance. After all, Microsoft wasn't even a Silicon Valley company. How could it steal the limelight from companies like Apple, Oracle, Sun, Intel, Cisco, and the other legends of the Valley? Such daring was so preposterous, I thought, that it might make a good story for an article. The article would be about how Microsoft and Intel would loose their grip on hi-tech.

In 1994 Microsoft was an unknown to most ordinary people. Its stock price, and hence its power, was still fledgling at $45 per share—about what it had been 2 years earlier. Windows 3.1 was no match for the Macintosh operating system, and few decision-makers in corporate America took Microsoft products very seriously. Personal computers would never become the fabric of the enterprise. Perhaps they could be used as terminals connected to the big machines, or maybe they could replace typewriters. But, the thought of turning control over to a

Microsoft product rarely gained much credibility. It was simply too risky for the bean counters.

The hardware side of the computer industry was a different question. Intel was already the darling of the stock market. Most people had at least heard of the company. Intel was respected for its revenue growth and was clearly pushing its way to the top of the computer hardware pyramid. Intel faithfully tracked Moore's Law, which required a doubling of performance every 18 months. And Intel had sustained its torrid pace for over two decades. Incredibly, single-chip processors were beginning to challenge the big guys. Intel was so successful that it invited major competitors.

Motorola, IBM, and Apple Computer had their own idea of who should be King of the Valley. The AIM (Apple-IBM-Motorola) consortium intended to stop Intel in its tracks. The battle storm clouds were forming as I sat with my friends and planned the downfall of Intel and Microsoft—what soon would be known of as the Wintel monopoly. Who would win, and who would lose in the next round? What fortunes remained to be gained, and what reversals of fortune awaited laggard companies?

The following essay offers three futures of the computer industry, circa 1994. In hindsight, the first two scenarios were completely wrong. But, the third scenario turned out to be exactly what happened between 1994 and 1998. AIM quickly collapsed—its fortunes were reversed—not Wintel's. The Wintel partnership was about to become a major swell as AIM and other challenges faded. But, I didn't know this in the warm and breezy summer of 1994 as I said goodbye to my friends and drove home, contemplating the purchase of more Apple Computer stock.

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*Article by Ted Lewis, Computer, August 1994*

# A Reversal of Fortunes?

If business is war, the computer business is thermonuclear war. Consider the latest battles of the decade: IBM's PowerPC versus Intel's Pentium, and Microsoft's Windows 4.0 versus everyone else.

In 1976, IBM sowed the seeds of its decline by canceling the 801 Project after several years of heavy R&D. The 801 was the original RISC project based on John Cocke's ideas. Because it would have led to the

obsolescence of IBM's own products, 801 was killed by the White Plains bean counters. As often happens with powerful organizations, a decade passed before the seriousness of this decision sunk in and IBM began reporting embarrassing balance sheets. But die-hard technologists at IBM hung in there to rise again, in the form of the workstation products group. Fortunately for IBM, fanciful RISC daydreaming resurfaced a decade later.

Then a funny thing happened while slumming with those wild-and-wacky upstarts at Apple Computer. Besides peddling disk drives to the Quiche Eaters of Cupertino, the IBMers discovered a shared taste for palace rebellion. In addition to putting IBM disk drives in Macintoshes, they concocted the PowerPC strategy to blunt the advances of the Huns of Microsoft and Intel and save Motorola and the American Way of Free Enterprise. The basic idea was that any challenge to Intel's dominance of the merchant processor market had to be commodity based. Millions of chips would have to be embedded in everything from personal computers to toasters. That is, the PowerPC had to be cheap and fast.

IBM and Apple made the game even more interesting by challenging the software platform responsible for selling massive quantities of Intel chips. Taligent was created to win the software platform wars, and Kaleida to win the multimedia application wars. Again, the strategy was simple: Flood the market with commodity-priced operating system software designed to knock off market leader Microsoft. With true competition returned to the marketplace, IBM and Apple would once again be able to play on a level field. Product quality rather than dominance would once again be rewarded. At least, that was the theory. Now, after billions of dollars and several years, what has changed?

It appears that the PowerPC is headed toward modest success, and the fortunes of Intel are challenged for the first time in a decade. We are on the verge of a new world. But which one? The following parallel universes suggest a major rift in the computer industry to rival the fall of mainframes.

# A Tale of Three Companies

Encirclement is a game of strategy, and operating system roulette provides the battleground. The PowerPC chip opens a short-term door for resetting the basic platform of desktop computing. A blitzkrieg of PowerPC boxes running the many dialects of Unix, MacOS, Microsoft Windows, and OS/2 stream out of Austin and Cupertino. Add some side skirmishes, like porting the MacOS to Sun, Hewlett-Packard, and other Unix boxes, and loyalty to Microsoft begins to crumble. The other shoe drops when Apple licenses the MacOS to third-party clone manufacturers in Taiwan who flood the market with low-cost PowerPC boxes. IBM licenses OS/2, and the clone-makers surge. Later in the decade, everyone wants the Taligent OS, and the panzer divisions close in.

Intel finds the shoe on the other foot connected to Motorola's body instead of its own. Intel boxes begin to look like closed proprietary systems that run only Windows 4.0 and Windows NT. In an attempt to recover, Intel races against time to get on the RISC bandwagon, adopting Hewlett-Packard's PA (Precision Architecture) RISC architecture. Intel and Microsoft attempt to quickly convert the base of software that needs an Intel engine and try to reconvince MIS managers at Fortune 1,000 companies that it is still the standard. The MIS managers are not convinced, since every operating system conceived by man runs on the new commodity-priced PowerPC clones. They now have a choice.

Microsoft becomes just a run-of-the-mill multibillion-dollar software company, and the housing market in Redmond takes a dive. Cairo, Chicago, Daytona, and subsequent counterattacks by Microsoft fail because those zippy applications (including Microsoft's) run on a PowerPC box under your favorite OS, and from your favorite vendor. The operating-system war ends, and vendors compete on the basis of quality, price, and value added. The story ends happily for the Quiche Eaters who divide a much bigger (quiche) pie because the clone-makers are now working for IBM and Motorola.

# Gone with the Wind

The personal computer industry wipes out the Unix workstation business with a slew of ultrafast boxes based on the PowerPC chip. Solaris, OSF/1, and the many dialects of Unix become too expensive to manage and maintain. Instead, Fortune 1,000 companies opt for the simplicity of PowerPC boxes that run Taligent frameworks or Windows NT on top of the Mach microkernel. Some diehards adopt OS/2 because it is even less costly to manage and maintain, and it provides a bridge from legacy Windows systems to the new world of frameworks. Novell NetWare also becomes a legacy system to be phased out (Novel and Lotus become application software vendors).

Seeing the handwriting on the wall, Intel converts its product line to the PA-RISC architecture over a period of years—becoming half its 1995 size. Microsoft also loses half its revenue because DOS and Windows lose out to Taligent and it takes too long for Microsoft to port Windows 4.0 to the PowerPC architecture. Bill Gates becomes the second richest person in the universe, after John Malone of Tele-Communications Inc. IBM once again dominates the computer industry, commanding 70 percent of the market. Apple becomes just another clone-maker, with most of its revenues coming from consumer electronic products like pagers and TV set-top boxes. Much smaller versions of Sun and HP enter the superPC business running the Taligent OS (and some Next OpenStep

applications). Silicon Graphics dominates the supercomputer market with revenues approaching $20 billion per year.

## Ironic Wipe-Out

Consumers ignore PowerPC, Taligent, IBM, Motorola, Adobe, Novell, HP, and Apple, and instead follow Microsoft, Lotus, Compaq, Dell and Intel as they lead the world down the x86/Windows 4.0 path. In the year 2000, Intel brings out the PA-RISC chip. Customers loudly complain as Microsoft and Lotus take two years to port their applications into the RISC world. While Bill Gates celebrates the purchase of Italy (for vacations), Apple, IBM, Motorola, and their followers file for bankruptcy. Customers display bronzed Sun, DEC, and HP workstations in glass displays as a reminder of the good old days.

Microsoft's Windows 6.0 running on Intel RISC chips dominates the personal computer industry. It features drag-and-drop e-mail just like Apple PowerTalk, rapid application development frameworks just like Taligent, multithreaded multitasking just like OS/2, and network-loadable modules just like Novell NetWare. Windows 6.0 supports built-in networking, SQL database access, and other plug-and-play features pioneered in 1984 by Apple. Ironic.