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APPLE'S X FACTOR

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Apple Computer's new OS X marks the death of one of the world's great operating systems. Rejoice!

I write this not as an Apple-basher, but as a long-disappointed Macintosh fanatic. Since its birth, the Macintosh has always had an excellent user interface but a crummy underlying operating system. Those problems date back to 1984, when Apple shipped the first Macintosh with Motorola's 68000 microprocessor rather than waiting for the more able-bodied 68010. That choice prevented Apple from incorporating technologies like memory protection and preemptive multitasking into the original Mac. The legacy of that mistake was nearly two decades of system crashes. But all of this history is about to be rendered moot.

With OS X, Apple is making a dramatic departure from the past. OS X (the X means 10) is a fundamentally new operating system that is merely pretending to be a Macintosh of old. This is big news—and not just for Apple users. Indeed, it may be bigger news to people using Microsoft Windows. What makes MacOS and Windows so important is their reach. MacOS is used by tens of millions of people every day, Windows by more than 100 million. These operating systems intimately influence the way people work and think. Their capabilities and limitations set the ground rules of what is possible and profitable for hundreds of thousands of companies. Killing one of these operating systems and replacing it with another cannot help but have far-reaching impacts.

And make no mistake about it—OS X is a different animal. Its visual similarity to earlier Mac systems is only a veneer. Apple's previous operating systems were purebreds, with an unbroken lineage going all the way back to the first Macintosh. OS X is a mongrel. Its foundation is Unix, the operating system that traces its ancestry back to Bell Labs and the late 1960s. And the user interface that sits atop this operating system also comes from outside of Apple; it was developed at NeXT Computers (the company that Steve Jobs started after being kicked out of Apple). OS X can run most existing Macintosh software, but this is done with a kind of computational sleight-of-hand.

Apple is betting that OS X will freshen the MacOS bloodline, overcome the Mac's inbred disorders and provide a new base for future expansion. It's a big gamble. If Apple succeeds, the impact will extend far beyond the current world of Mac users. For starters, OS X could dramatically expand Apple's current user base. More importantly, Apple's increasing relevance will ensure that its innovations will show up in software from Microsoft and in hardware from top PC vendors like Compaq Computer, Dell Computer and Gateway.

To understand the predicament that Apple is trying to dig itself out of—and to understand why a successful turnaround could have such widespread impact—it helps to look at the company's history. As we shall see, the endless comparisons between Apple's MacOS and Microsoft's Windows are misleading at best and, for Macintosh supporters at least, grossly unfair. Apple likes to remind the world that "Apple ignited the personal-computer revolution" when it introduced the Apple II in 1977. In fact, Apple was just one of more than a dozen companies that launched home computers (or "micro-

computers," as people called them back then) in the late 1970s. Each of these computers came with its own operating system: applications software developed for one computer wouldn't run on another. By adopting this strategy, microcomputer makers were following the lead of companies that produced minicomputers and mainframes—companies like IBM, Digital Equipment and Wang Laboratories.

Within a few years of the Apple II's debut, there followed a whole set of "business-class" microcomputers from other manufacturers. Most of these machines ran a common operating system, called CP/M, which had been developed by Digital Research. CP/M was extraordinarily simple—all it could do was read keystrokes, display characters on the screen, manage files on a floppy disk, load programs into memory, and run them.

Rudimentary though it was, CP/M had enough power to give birth to the microcomputer software industry. My first exposure to a computer was with a Xerox-built CP/M machine that my father bought in 1980. It ran dBase II (a database program) and WordStar. When IBM brought out its PC in 1981, it was a late entrant into the game. The company hired a tiny company called Microsoft to write a clone of CP/M called PC DOS. (Microsoft had actually bought DOS from Seattle Computer Products for $50,000 and sold the program as its own.) Like CP/M, PC DOS could do little other than manage disk files, load programs into memory and keep them running.

At the time, Apple was criticized for not building its own CP/M or DOS-based computer. But Apple's business model—and its corporate structure—were based on using proprietary but innovative software so that it could enjoy significantly higher margins on its hardware than its competitors could ever justify. (How IBM overcame its corporate culture to build a PC without its own proprietary operating system is a story that has been well chronicled by others.) So rather than join the pack, Apple decided to leapfrog. Instead of using Intel's popular 16-bit processor, Apple opted for Motorola's new 32-bit 68000. Apple also concentrated on developing a graphical user interface that would make the computer dramatically easier to manage—and thus expand the market to a whole new class of customers who felt put off by the PC's techie look and feel. After two failed attempts (the $10,000 Lisa and the Edsel-like Apple III), the company finally got it right in 1984 when it introduced the Macintosh.

For this reason, attempts to compare Apple to Microsoft misunderstand what drives the two companies. Microsoft innovates software. But with the exception of the Macintosh user interface, virtually all of Apple's innovations have been in hardware. Apple popularized the mouse and 3.5-inch floppy disks. Apple introduced trackballs and then touch pads on laptops—in the process pushing the keyboard to the back of the laptop and creating a wrist rest, which is today standard on almost all portables. Now, Apple is pushing wide-format displays—screens considerably wider than they are tall, more akin to a movie screen than a TV—into the mainstream. Within three years, such displays will probably be standard in the PC world as well.

What's exciting for me about OS X is that this the first time in more than a decade that Apple has introduced a significant software innovation. And oh my, is OS X significant! For starters, consider its geeky underpinnings. For more than three years, analysts have been hailing the arrival of a Unix variant called Linux (or GNU/Linux, to give proper credit to its many developers). But although Linux has charmed the code-breathing set, it has made little headway into homes and businesses because it is too hard to use and too unlike Windows and the MacOS. OS X will change this. Unless an atomic bomb goes off at Apple's headquarters in Silicon Valley, by this time next year Apple will be the world's largest supplier of Unix-based operating systems. OS X will prove that it is possible to give Unix a friendly wrapping. The impact will also be felt by Bill Gates's little enterprise because, for the first time ever, Apple's operating system will be more stable and faster than Microsoft's.

OS X also brings with it Cocoa—a new set of tools for writing desktop applications. These tools evolved from

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NeXTStep, the development framework for the NeXT computer. I wrote a book about NeXTStep back in 1993, so perhaps I'm biased. But practically all the programmers I knew told me they could write applications with NeXTStep five to 10 times faster than they could for Windows. If Cocoa is even half as good as NeXTStep (and initial indications are that it is better), we could see an explosion of high-quality applications written by individuals or extremely small companies. This means that OS X has the power to revolutionize the software industry.

Initial reception of OS X has been lukewarm at best. Many users seem to think that Apple invested too many resources in "eye candy." As you move windows around the screen, for example, they stretch and warp as if painted on sheets of rubber. And because OS X is a fundamentally new operating system, it doesn't yet work with many scanners, digital cameras and other peripherals (compatibility will come when the necessary drivers are written). But within a year, these minor problems will have been overcome. What remains will be the start of the next big thing in desktop computing.