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SUN'S JAVA: THE THREAT TO MICROSOFT IS REAL
by Brent Schlender

SUN MICROSYSTEMS ONCE HYPED ITS NEW SOFTWARE LANGUAGE AS A WAY TO MAKE WEB PAGES EXTRA-CUTE. ALMOST BY ACCIDENT IT UNLEASHED THE NEXT GREAT WAVE IN COMPUTING.

If he doesn't already, Bill Gates may come to regret Pearl Harbor Day 1995. That was the day he outlined Microsoft's grandiose plan to make war with Netscape Communications and morph itself into the overlord of the Internet. It was also the day the mighty billionaire blinked. As part of his presentation to financial analysts and the press in Seattle, he announced that Microsoft would climb on the bandwagon for Java, a hot new Internet programming language promoted by his nettlesome archrival Sun Microsystems. Gates had no choice, really, but to go along with Sun. In so doing, however, he exposed Microsoft to a threat more dangerous than any Netscape could present.

Java is one of the hyped-up Internet software technologies that have spawned the World Wide Web, awful words like "intranet," and those strange-looking addresses on business cards and TV commercials. Originally known as a way to jazz up Web pages with graphic animations -- stock tickers that crawl across your screen, for example, and dancing icons -- Java has quickly evolved into a whole lot more. To Microsoft's dismay, it is fast becoming what is known as a computing platform -- a sturdy base upon which programmers can build software applications.

Java is making possible the rapid development of versatile programs for communicating and collaborating on the Internet. We're not just talking word processors and spreadsheets here, but also applications to handle sales, customer service, accounting, databases, and human resources -- the meat and potatoes of corporate computing. Java is also making possible a controversial new class of cheap machines called network computers, or NCs, which Sun, IBM, Oracle, Apple, and others hope will proliferate in corporations and our homes.

The way Java works is simple. Unlike ordinary software applications, which take up megabytes on the hard disk of your PC, Java applications, or "applets," are little programs that reside on the network in centralized servers. The network delivers them to your machine only when you need them; because the applets are so much smaller than conventional programs, they don't take forever to download.

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Say you want to check out the sales results from the Southwest region. You'll use your Internet browser to find the corporate intranet website that dishes up financial data and, with a mouse click or two, ask for the numbers. The server will zap you not only the data, but also the sales-analysis applet you need to display it. The numbers will pop up on your screen in a Java spreadsheet, so you can noodle around with them immediately rather than hassle with importing them to your own spreadsheet program.

To graph the numbers, you'll call in a charting applet that will let you print out your report nice and pretty, all without leaving your browser. And you'll always get the latest, greatest version of the applets too: Since the software is stored in only one place, corporate techies can keep it up to date more easily.

The real beauty of the Java language, however, is its power to save users money. Corporate chief information officers, a.k.a. CIOs, think Java may be software's holy grail both because it vastly simplifies creating and deploying applications and because it lets them keep their existing "legacy" computers and software. Java programs, once written, can run without modification on just about any kind of computer: a PC, a Macintosh, a Unix workstation -- heck, even a mainframe. The underlying operating system makes no difference. Java actually can breathe new life into older specialized computers that were at risk of becoming obsolete.

In scarcely a year, Java has evolved into a major challenger to Microsoft's Windows family of PC operating systems -- faster even than DOS and Windows rose to challenge traditional mainframes and minicomputers. Java is also well on its way to becoming the most important Internet software standard, catapulting Sun past Netscape and Microsoft as the leader in Internet computing.

While Sun is essentially donating the Java language to the computer world by publishing all the specs and letting anybody use them, the technology will spur lucrative growth for the company. It should fuel already blazing sales of Sun's Internet servers (which can cost up to $25,000) and jump-start its new line of sub-$1,000 JavaStation network computers. Java will also rev up demand for Sun's software development tools and for special Sun chips that other computer makers can use to make their machines run Java faster. The halo effect from Java is a big reason Sun's stock has become hot (see chart "In the Sack with Java").

In short, Java is outstripping its own breathless hype -- and causing headaches for Microsoft by soaking up industry resources. Already tens of thousands of programmers are writing Java code, as hundreds of commercial software makers and corporate information-systems departments put their best people on Java development. Sun, IBM, and Compaq Computer, among others, have ponied up a $100 million venture-capital pool called the Java Fund to help seed startups. And although it is politically incorrect for them to say so, even engineers in the bowels of Microsoft seem jazzed about Java.

For Sun CEO Scott McNealy, it's a pipe dream come true. "We always thought we were onto something with Java -- that it was our one big chance to challenge Microsoft and to change the economics of the business," he says. "But I have to admit I never thought Java computing could unfold quite this quickly, or with such universal support from customers and competitors. It's astounding, really."

Most of us don't know (and don't want to know) the first thing about

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computer languages. Yet they are the catalysts of change in computer technology. Mainframe computers weren't of much use in the workaday world until Cobol came along and made it easy to write accounting and inventory programs. IBM's Fortran language made it possible to program engineering workstations and supercomputers for scientific analysis. It was Basic -- a version of which was Microsoft's very first product -- that let hobbyist hackers program early personal computers. Another language known as C++ streamlined development of point-and-click graphical programs like the ones we use on Windows PCs and Macs.

Java looks like the language best suited to Internet computing not just because it doesn't favor or discriminate against specific machines but because it is inherently virus-proof -- the language was designed so applets can't alter data in your computer's files or on its hard disk. (McNealy pucklshly calls using Java programs the equivalent of "practicing safe computing.")

Java is also one of those charmed technologies -- Microsoft's original DOS operating system is another -- that arrived at exactly the right place at the right time. Since Sun introduced Java in May 1995, a constellation of forces -- other Internet innovations, software economics, industry politics, and customer need -- aligned almost simultaneously to let Java emerge.

Adam Smith would be proud, because it is the marketplace more than anything that is driving Java computing. Over the past decade, companies have spent hundreds of billions of dollars on information technology (IT) systems and software, much of it to equip virtually every desk in white-collar America with a PC and then to link the machines into networks.

But even as PCs get cheaper and more powerful, they grow ever more expensive and difficult to maintain. An oft-cited Gartner Group report estimates that companies must spend more than $6,000 a year on hardware and software upkeep for a $2,000 PC that runs Windows 95. CIOs are finding this mind-boggling sum harder and harder to justify, much less afford. So they are willing to try just about anything to push down those costs.

At the same time, the industry's two near monopolies -- Microsoft with its Windows system software and Intel with its microprocessors -- are leaching more and more of the profit from the PC business. Resentment has grown as profit margins have shrunk at companies like IBM, Apple, Lotus, and Borland. All would like nothing better than to take Microsoft down a peg. Customers, too, are increasingly uneasy as the Wintel duopoly threatens competition and product choice. At a recent FORTUNE-sponsored Internet conference in Chicago, several IT professionals said they were rooting for Java computing if only to keep Microsoft from being able to dictate corporate computing technologies and strategies.

For IBM and Apple, Java may prove nothing less than a godsend. Big Blue sells five different types of computers and operating systems -- mainframes, minicomputers, workstations, and two flavors of PC -- none of which is compatible with the others, much to customers' frustration. Now the company is hard at work building high-performance versions of Java into each of its operating systems so that for the first time in its history, IBM's entire computer line will be able to share software. (Ironically, Microsoft, which itself has fostered several slightly incompatible versions of Windows, stands to benefit in much the same way.) Apple, which many customers have deserted because of

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the Mac's incompatibility with Wintel PCs, has a chance with Java to be relevant again.

Likewise, Java gives software companies a way to win back some of the business they lost to Microsoft as it methodically parlayed its ownership of Windows into dominant positions in applications software. Lotus, now part of IBM, was one of the biggest losers, falling from first place in spreadsheets in the early Nineties as PC users switched from DOS to Windows, a transition Lotus was late to spot. Lotus foresees a similar shift now to Java computing, in large part because Windows and the Microsoft Office word-processing and spreadsheet programs have become so massive and feature-laden that they bog down all but the most powerful PCs.

Lotus plans to jump into the Java business in a big way: by reinventing its software as a host of cheap little applets. The Java language lets programmers use software "components" -- Tinkertoy pieces handling specific tasks, such as text editing, charting, modeling, or business-form design. Components can be assembled quickly and easily into all manner of customized applications, which is just why Lotus loves them.

In the past six months, Lotus has reassigned hundreds of programmers to develop Java versions of its $399 SmartSuite personal productivity applications. Next year Lotus plans to start selling sets of SmartSuite Java components that deliver the big program's most popular features at a fraction of that price. Lotus is also converting much of its popular Notes groupware to Java component code.

Components could change the whole economics of the software business. Says Jeff Papows, president of Lotus: "I am the second-biggest Java fan in the industry, behind only Scott McNealy. Why? Java will be instrumental in loosening Gates's stranglehold on the world."

There's more than envy at work here. Java computing will also let corporate users fundamentally change the way they do business (see "Flowers from Java," below). That's because with Java it's easy to develop safe programs that allow customers and suppliers to tap into each other's private computer networks -- say, to place orders or check design specifications. Says Joseph Duncan, a senior vice president at Oracle: "What is galvanizing support for Java is that when your customers and suppliers can interact directly, your information systems can actually drive sales and shorten the supply chain. That affects the bottom line, which is something CIOs would love to be able to take credit for."

That all sounds well and good for Sun. But establishing a new software platform that satisfies not just dozens but hundreds of die-hard competitors isn't easy. To coordinate the effort Sun has launched a subsidiary called JavaSoft, whose purpose isn't so much to make money from Java as to keep Java licensees marching down the same path. It's as much a political challenge as a technical one.

The keys to Java's success as a platform are ubiquity and absolute compatibility throughout the industry. To achieve ubiquity, Sun hitched a ride on Netscape's popular Navigator Internet browser, the program that unleashed the whole Internet phenomenon in the first place. Although the early version of Java in Navigator was slow and balky, it still created buzz in software circles because it showed that Java applets could indeed travel over the Net and be used by any type of computer. The Internet was already awash with multimedia bells and whistles, but Java brought a way to build real programs for the corporate world.

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For Java to arrive as an industrial-strength software development platform, Sun has to vastly improve its performance so it can load and run applets faster. The best way to accomplish this goal is to get makers of operating systems to integrate Java into their software, like an exotic new fruit grafted onto old rootstock. It's a sensitive matter because software companies are finicky about their operating system code and don't like to let outsiders muck about with it. Customer demand is such, though, that in the coming months every major operating system company, including Microsoft, plans to roll out versions of their operating systems spiked with what Sun calls "Java Virtual Machines."

Gates can thank little Netscape for putting the $9 billion software behemoth in the extraordinary position of having to support a technology that could badly undermine Windows. Once Gates decided he wanted to unseat Netscape as the Internet browser king, Microsoft had to incorporate Java into its own browser, Internet Explorer, just as Netscape had done with Navigator. Internet users wouldn't stand for anything less. Microsoft became a Java licensee in March, after four months of haggling over price and other details.

Gates and his top lieutenants in Redmond, Washington, are usually voluble when asked about threats to Windows and other Microsoft products. But they don't seem to want to say much about Java, perhaps because they would have to talk out of both sides of their mouths. Microsoft will likely be the key purveyor of Java Virtual Machine software because of its 90% share of desktop operating systems. (JavaSoft president Alan Baratz crows that the snappiest of all the Java Virtual Machines may well be Microsoft's, to be bundled with Windows early next year.) But Microsoft still derides Java as merely a "mildly interesting programming language" and is doing all it can to torpedo Java with its own Internet software component technology, ActiveX. Microsoft claims ActiveX uses PC hardware and software better than Java does. But the people at Sun and IBM, among other critics, note that only Windows PCs can take full advantage of ActiveX. That's why they mockingly call Microsoft's technology CaptiveX.

So far Sun seems to have done everything right. It has kept its fractious Java allies in line and launched work on a flock of interesting Java devices and software. Sun is developing a miniature operating system of its own, ideal for running applets, called JavaOS. It will power Sun's JavaStation network computers; Sun will even hard-wire parts of the OS into microprocessors it is creating for the machines. The chips and software will be cheap enough to go into printers, video kiosks, set-top boxes, printers, and even cellular phones. One of the more intriguing products under development is an NC for the seatbacks in airliners, on which a passenger can surf the net, watch movies, or play video games with other passengers.

While McNealy concedes that Sun hasn't made big money from Java yet, indirect revenues could start pouring in soon. For the quarter ended September 29, Sun's revenues grew 25%, to $1.9 billion, and profits swelled by 45%, to $123 million, largely because of booming sales of server hardware. Java would keep that boom going by spurring Internet computing. Sun is also benefiting from its newfound high profile. One of McNealy's goals is to get Sun's historically ordinary price/earnings ratio up nearer Microsoft's P/E of 39. Sun's has grown steadily since Java burst on the scene, and recently reached 25.

Yet the profits Sun reaps from Java will never match the heady sums that Microsoft and Intel have made from the Wintel platform; Sun will earn only modest sums from Java licensing fees and the sale of chips and the JavaOS. Sun really has no choice but to give its language to the

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world; all of Java's ardent backers would flee if they glimpsed the specter of another Microsoftian monopoly.

And so it should be in the era of Internet computing, contends Irving Wladawsky-Berger, IBM's Internet czar and chief Java strategist. "In the past, power and success in the computer industry all boiled down to who controlled the key technological chokepoints," he says. "That's what IBM did in the 1960s and 1970s, and that's what Microsoft is doing now. Customers don't want that kind of industry domination anymore, and at this point neither do we at IBM. That's why Java is different. Sun is leading it, but by design nobody really owns it."

Sounds nice and democratic, right? But in an industry that often resembles a street brawl, enlightened self-interest has never counted for much. And although Gates and Microsoft may be co-opted for now, they won't give in easily. Remember Pearl Harbor.

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