

U.S. economic structure overview circa 1985

See chapters I and II of *The Winning Performance—How America's High Growth Midsize Companies Succeed* by Donald K. Clifford, Jr. and Richard E. Cavanagh

19 million businesses

15,000 mid-size business (\$25 million to \$1 billion in revenues)

The top of the Fortune 500

The rest are small business

As Biggest Business, Wal-Mart Propels Changes Elsewhere

By LESLIE KAUFMAN

October 22, 2000

Sometime before the end of the year, a milestone in American capitalism will pass. Wal-Mart Stores' annual sales are on track to exceed those of General Motors, the largest American company for much of the last half-century.

Soaring oil prices will help Exxon Mobil edge Wal-Mart out of the top slot this year, but oil companies' fortunes routinely rise and fall with the state of affairs in the Middle East. In contrast, Wal-Mart's relentless and rapid rise is transforming whole industries, from consumer manufacturing to retailing and food processing and sales. Indeed, its reach is now so broad that Wal-Mart is lending extra momentum to important elements of the new economy, including the globalization of manufacturing and the use of technology to achieve productivity gains.

Wal-Mart did not seem a likely heavyweight in 1962, the year Sam Walton opened his first store in Rogers, Ark., with a sign saying "Wal-Mart Discount City. We sell for less." But the

retailer, based in Bentonville, Ark., has built a nearly \$200-billion-a-year empire by selling astonishing quantities of all manner of items from lawn mowers to toilet paper.

Total annual retail spending in America, excluding automobiles and boats, is roughly \$2.3 trillion. Wal-Mart's domestic sales for the fiscal year ended in January were \$142 billion, or 6.2 percent of the total. To put it another way, Wal-Mart sells 19 million pairs of women's jeans a year and an average of 19,634 pairs of shoes an hour.

In keeping with its founder's determinedly humble and press-shy persona, Wal-Mart has no plans to celebrate its ascendancy. "We don't keep track," Lee Scott, Wal-Mart's chief executive, said. Still, as Mr. Scott admits, the company has been a force behind "driving unnecessary costs out of businesses."

That is an understatement. To keep its prices low, Wal-Mart is always pushing its suppliers, an army of more than 65,000 companies, to become leaner machines that examine every penny they spend.

This ruthless drive to cut fat has clearly reshaped the practices of both businesses that have worked with Wal-Mart and those that compete against it. The Wal-Mart hallmarks for keeping costs down — the use of cutting-edge technology, masterful logistics, reliance on imported goods and a nonunion work force — are becoming industry standards.

Those retailers that have failed to keep up have suffered. Wal-Mart's potentially devastating effect on mom-and-pop businesses has been widely reported, but many in the industry argue that Wal-Mart is now large enough that it is also driving midsize to large players out of business and speeding consolidation among others. (Philip Morris's

decision to merge the food giants Kraft and Nabisco into one entity, for example, was seen by many as a way to increase its leverage with retailing giants.)

And while Wal-Mart's business practices are greatly emulated, they are often controversial. As Wal-Mart accelerates its drive to open stores abroad, local groups have formed to protest the company's practices. Labor advocates say overseas factories that supply Wal-Mart are routinely among those with the worst working conditions. In addition, as Wal-Mart begins to compete with American businesses that are mostly unionized, labor unions, their members and some local government agencies are arguing that the company is big enough to exert downward pressure on benefits and wages across whole regions of the country.

"If you are an admirer of capitalism, they are the epitome of it," said Carl Steidtmann, an economist with PricewaterhouseCoopers who studies retailing. "They are the prime example for the good and bad."

Wal-Mart is considered so efficient that executives at retailers from Bloomingdale's to Banana Republic openly admire it. Less direct homage is paid every day by competitors. When Charles Conaway, the new chief executive of Kmart, announced last summer that his first major move with the company would be to spend \$460 million to upgrade information systems, he was tipping his hat to Wal-Mart.

Doing business the Wal-Mart way means constantly figuring out how to cut costs. Some manufacturers say that Wal-Mart is heavy-handed in pressing suppliers on details of their operations, like the location of their corporate offices. (Wal-Mart, located in out-of-the-way Bentonville, hates high urban

rents.) One corporate executive, who asked not to be named, tells of a vendor summit meeting called by David Glass, Wal-Mart's chief executive until January of this year, where the attending executives were chastised for flying in on private jets. (At the time, Bentonville had limited direct airline service.) Wal-Mart officials, asked about the story, said the company did not discuss meetings with vendors.

But most suppliers say the real pressure arises when Wal-Mart demands a particularly low wholesale price. They say the chain does not care how a supplier meets its demands. Many argue that doing business with Wal-Mart is a good thing, a trial by fire. "I went there knowing we were going to get squeezed and wrung and twisted — all in positive ways," said Paul R. Charron, chief executive of Liz Claiborne Inc., which designs the Russ clothing brand especially for Wal-Mart.

For the Wal-Mart account, Mr. Charron built a separate staff with offices outside New York. He employs fewer people there than he does for servicing department stores and relies heavily on technology, which he calls "faster, quicker and cheaper when optimized."

Even so, Mr. Charron's staff still finds itself in frequent discussions with Wal-Mart over costs, even very small ones. "They will ask if that zipper is right, or does that piece of lace trim add value," he said.

Mr. Charron says that the lessons from Wal-Mart have made Claiborne a tighter ship.

Hal J. Upbin, chief executive of the Kellwood Company, an apparel manufacturer that does about \$200 million in annual business with Wal-Mart, concurs. "They are tough," Mr. Upbin said. "They want the lowest prices, and

it requires a lot of creativity and ingenuity on our part" to meet Wal-Mart's needs.

Whether Wal-Mart's demands cross the line from the obsessive to the crushing is a subject of hot debate among suppliers. But Wal-Mart's purchasing power is so great that none of its trading partners were willing to go on the record saying negative things about it.

Still, it is not hard to find companies whose bottom lines have been wounded by the retailer. In the 1990's, Rubbermaid was the leading brand-name maker of common kitchenware and household items like laundry baskets. But when the price for the main component in its products, resin, more than tripled between 1994 and 1996, Wal-Mart balked at paying increased prices.

When Rubbermaid insisted, Wal-Mart relegated the manufacturer's items to undesirable shelf space and used its market power to promote a Rubbermaid rival, Sterilite, which made lower-priced nonresin products. Profit margins fell substantially at Rubbermaid, and it has since been bought by another household goods giant, Newell.

Neither Wal-Mart nor Newell Rubbermaid would comment on their relationship.

Still, while companies complain, many economists, market analysts and even government regulators see as something bordering on heroic the Wal-Mart effort to use its formidable market share to start its own brands and to break up monopolies in price-inflated categories.

"They have done more than Alan Greenspan to lower prices," said Burt Flickinger III, managing director of Reaching Marketing, a consulting firm in Westport, Conn., that frequently works for the Federal Trade

Commission. "In the case of vitamins, pet food and baby formula, they have broken the half-nelson" of the dominant companies.

In the mid-1990's, for example, seven companies controlled 90 percent of the market for multivitamins. Last year, a federal judge approved a settlement in which all seven pleaded guilty to charges of price collusion. But Wal-Mart changed the landscape in that business in just 15 months. It introduced its own product, called One Source, in 1997, and it is now among the top-selling multivitamins in the United States.

While economists wax ecstatic about Wal-Mart's effect on domestic consumer prices, the company has become a target of labor activists.

Wal-Mart discontinued its once heavily advertised "Buy America" program, which contained a pledge to use domestic suppliers wherever possible, in 1998 in tacit recognition of its dependence on foreign suppliers. But Wal-Mart has been caught numerous times having subcontracted work to vendors operating under abusive conditions.

"In country after country, factories that produce Wal-Mart goods are the worst," said Charles Kernaghan, executive director of the National Labor Committee. "They will cut every single corner available." The National Labor Committee, a nonprofit group that addresses concerns of global workers, was instrumental in exposing the fact that sweatshop workers were making products for Wal-Mart's Kathie Lee Gifford clothing line.

Wal-Mart vigorously disputes those charges, saying it has a strict code of ethics and that it cuts off contractors who violate them. "There will always be people who break the law," said Mr. Scott, who argues that most

Wal-Mart manufacturers provide decent working conditions.

As the largest private employer here at home, with more than one million full-time and part-time employees, Wal-Mart's rabidly antiunion stance is increasingly making the retailer a lightning rod for many labor disputes, particularly over health benefits. Take the example of food workers. In 1987, Wal-Mart started selling groceries, and it is now closing in on a stunning 10 percent share of grocery-chain sales.

Most food workers in this country are unionized, however. And with labor accounting for roughly 60 percent of most grocery companies' fixed costs, differences in pay scales can be deadly. Nearly a dozen regional grocery chains have folded in the last five years. The big players say they are going to have to match Wal-Mart on wages and benefits to survive. "When a competitor comes in, you have to mimic their operations, and you get reduced to the lowest common denominators," an executive at a competing grocery chain said.

Jay Allen, a Wal-Mart spokesman, disputed that contention. "It defies logic that we attract that kind of work force, especially in a low-unemployment time, if we are not paying competitive wage and benefits." Mr. Allen said.

More broadly, Wal-Mart argues that it has lifted the quality of life for thousands of employees by giving them access to stock options and by promoting aggressively from within.

The company also says it has made life better for middle-income Americans in general.

"We have, in fact, raised the standard of living for the working person," Mr. Scott said. "Driving inflated profits out of doing business

has been good for the person who works hard every day, and that will be our lasting impact."

Management: Anticipating Welch on Welch in His New Book

November 29, 2000

By ANDREA GABOR

For most of his two decades at the helm of the General Electric Company, John F. Welch Jr. has thought of himself as a teacher. One of his first acts as chief executive was to rebuild Crotonville, G.E.'s management training center at Croton-on-Hudson, N.Y., into the West Point of his strategic and managerial revolution.

In the intervening years, Mr. Welch became a fixture at Crotonville, interacting with hundreds of G.E. managers each year. Now, for his final lesson before making way for his newly named successor, Jeffrey R. Immelt, 44, the head of GE Medical Systems, Mr. Welch is writing a book that promises to be a must-read for all students of management.

"Teacher" might seem an odd appellation for the decidedly unprofessorial Mr. Welch. This, after all, is a man whose mass layoffs earned him the nickname Neutron Jack and whose rapid-fire speech aggravates a stutter and rarely ends in a complete sentence.

Although he is a self-described news fanatic who devours magazines, he acknowledges he does not read "a lot of big heavy books" unless they happen to be written by Peter F. Drucker, the management guru who inspired two of the so-called big ideas that have been part of Mr. Welch's G.E. tenure. Instead, Mr. Welch cultivates an informal network of advisers that include the world's leading corporate chieftains, academics and consultants.

Still, it is a measure of his reputation as a teacher that his book, which is scheduled for publication next year, is already being hailed as the most important management text since Alfred P. Sloan's 1964 classic, "My Years With General Motors."

"Most of the books written by business people are narrowly focused on the wonders that they've created" in a specific industry, says Walter B. Wriston, the former Citibank president who served on G.E.'s board for almost three decades. "G.E. is the closest thing to a broad spectrum company you can find, and Jack Welch is blessed with an extraordinarily inquiring mind."

Much of the buzz about the book, of course, has been driven by the record \$7.1 million advance that Time Warner Trade Publishing is paying Mr. Welch. Time Warner will have to sell an estimated 1.6 million hardcover copies just to break even. The highly personal autobiography of Lee A. Iacocca, the former chairman of Chrysler, is the only book by a chief executive that has sold more.

Mr. Welch's book, by contrast, is expected to be all business, and what new ground it will break is anybody's guess. A cottage industry of books about G.E., many written with Mr. Welch's cooperation, has flourished in recent years, including "Jack Welch and the G.E. Way," (McGraw-Hill, 1998), one of three books on Mr. Welch by Robert Slater, and "Control Your Destiny or Someone Else Will," by Noel M. Tichy and Stratford Sherman (Doubleday, 1993.)

But in a recent interview, Mr. Welch discussed both his accomplishments and some of the lessons he had learned while transforming G.E., which in 1981 had \$27.9 billion in sales, mostly in industrial products, into the \$170 billion conglomerate it is today,

with interests ranging from aerospace to network television to finance. When it completes its deal to acquire Honeywell International for \$44.5 billion, G.E. will have a market capitalization of \$521 billion, the largest in the world. And Wall Street loves the more than 100 quarters of uninterrupted growth in net income that have occurred under Mr. Welch.

How to explain this success? Mr. Welch's book will almost certainly hammer home three points that have become his mantra. Managers should:

- Create leaders. "In the end, the plate looks prettier than the making of it," he said. "My job is selecting people, evaluating people, giving them self-confidence and spreading ideas."
- Focus on a few simple big ideas and dedicate the resources needed to drive them home.
- Master and inspire continuous change. "The most difficult thing in an organization is to get people to act on change," he said.

Consider one of his early dictums: Cutting out any business that was not No. 1 or No. 2 in its market, including the small appliances that put the G.E. logo in nearly every American home. When that strategy became "a little tired," he said, he modified it. "The bureaucracy had learned to be No. 1 and No. 2 by shrinking their defined markets. We shrank our visions."

So in the early 1990's, he insisted that every business expand that definition to show that it was serving only 10 percent of the market, with room to grow. That strategy became the vehicle for expanding into services and becoming more global. "Welch has an enormous dissatisfaction with how good he's been," said David O. Ulrich, a professor of business

administration at the University of Michigan and a former G.E. consultant. "He is consumed with, 'What's next?' "

Mr. Welch does not dwell on his mistakes. Readers of his book, however, will want to know, among other things, how he handles dissent in a company he often rules like an autocrat. They will also want to hear his view of ethical lapses and outright fraud at businesses like Kidder Peabody, which G.E. sold after a scandal and huge losses. G.E. is still embroiled in controversy over the dumping of toxic PCB's in the Hudson River years ago, and some critics say that the company has been slow to promote women and minorities.

For now, the Honeywell acquisition, announced last month, is absorbing much of Mr. Welch's time. G.E. is struggling as well to superimpose its values, including Mr. Welch's commitment to steep pay differentials, on foreign subsidiaries that have vastly different cultures.

But given that Mr. Welch is a management icon, he is expected to focus most on his leadership agenda. And the key to that — and, in all likelihood, the road map for his book — can be found at Crotonville. Even as he was laying off people and shuttering factories in the early 1980's, he was pouring millions of dollars into turning the center into a laboratory for the half dozen "big ideas" that have reshaped G.E.

The heart of Crotonville is the Pit — the circular, tiered lecture hall where Mr. Welch conducts free-wheeling discussions with his managers. The Pit is modeled after a gravel-filled field where he played ball as a boy in Salem, Mass.

To understand Mr. Welch, one has to understand the culture of the Salem pit, says

Samuel E. Zoll, a childhood friend who is now a Massachusetts judge. "The neighborhood and local park were the center of our universe," Mr. Zoll said. It was a place where the local boys organized their own games because their parents were struggling to make ends meet right after World War II. That required cooperation, he said. The children created their own teams, scheduled their own tournaments and even swept the gravel in the spring and shoveled the snow in winter.

But the pit was also a place of intense competition where the bigger kids called the shots. To play, the younger boys "had to finagle" their way onto the field, Mr. Zoll said.

"There was a fight almost every day," said Larry McIntire, Salem's parks superintendent and another denizen of the pit. And Mr. Welch was not one to back down, Mr. Zoll said. "I can still picture him jawing with a guy one and a half times his size. Welch stands square in front of the guy yelling, 'It's our turn. Losers out.' " To the surprise of his teammates, he said, the big guys eventually left.

In his twice-monthly Crotonville sessions, Mr. Welch hammers home his ideas and expectations and challenges his audience — both senior executives and middle managers — to identify problems and unmet opportunities. "Mr. Welch has learned that the role of the C.E.O. is like that of the actor in an old Greek play," Professor Ulrich said. "You've got to overact to get the people's attention at the back."

Mr. Welch favors folksy metaphors and always packages his ideas in simple sound bites: "No. 1 and No. 2," "fix, sell or close," "Work Out," "Six Sigma." The ideas can come from almost anywhere. One of Mr. Welch's recent

favorites — having twenty-something Internet mavens mentor old fogeys like himself — comes from a subsidiary in Britain. The program is vintage Welch: it gives young people access to the boss's office and senior managers a pipeline to what he calls "hallway gossip."

Yet, carrying out the core ideas can be difficult, as Mr. Welch's book is likely to show. Take "Work Out," a grass-roots approach to rooting out bureaucracy. The idea was inspired by a particularly acrimonious Crotonville session after G.E.'s first major downsizing. Despite a 25 percent cut in the work force, the old inefficiencies remained. So in the fall of 1988, Mr. Welch hired 40 experts from the top business schools to create a system for rooting out bureaucratic waste.

During Work Out sessions, managers have to make on-the-spot decisions to accept or reject suggestions made by subordinates, though in some cases they can request more information. "It took five to seven years and thousands of meetings," Mr. Welch said, "but now people think that's just how the company works."

Not all of Mr. Welch's ideas emerge with a flash of blinding light. The journey to Six Sigma, a statistical quality measure for bringing defects to near zero, was fraught with years of misunderstanding and opposition. Powerful subordinates began pushing for a quality program just as their boss was starting Work Out, and he was not pleased. In particular, Brian Rowe, then the head of G.E.'s aircraft engine division, had embraced the quality philosophy of W. Edwards Deming.

Such an open challenge was like being the only guy with an "A.C.L.U. membership at a Jesse Helms fund-raiser," said Todd Wilkinson, a former G.E. engineer. "The scuttlebutt was that Welch hated Deming's philosophy."

He certainly disliked it. "I was never much of a believer," Mr. Welch said. "I didn't quite understand it. I didn't think it had companywide application." He was finally swayed to adopt quality control, but not the Deming method, by a fellow chief executive, Lawrence A. Bossidy, who became a Six Sigma devotee when he joined Allied Signal.

Soon, "G.E. became the standard for Six Sigma," said Subir Chowdhury, a leading quality expert in Detroit. For Mr. Welch, who once bested Greg Norman at golf, a decisive moment arrived in the fall of 1995 when he canceled an executive golf outing in favor of a Six Sigma briefing. The ideal symbol to usher in the next big idea.

Japan moves factories to China

DONGGUAN, China (AP) - Ringed by low-rise factory blocks, this grimy and chaotic southern Chinese city seems an unlikely center for the kind of high-quality, precision manufacturing found in Japan. But change is afoot in Dongguan this year. Japanese companies that once shunned China are making copiers, CD players and computer printers here. Emulating rivals from Taiwan and Hong Kong that long ago made the move, they've hired thousands of low-wage Chinese workers - despite concerns the work force won't live up to Japan's manufacturing standards. The turnaround by conservative Japanese companies adds to a global brawl that is overturning traditional ways of doing business. Confronted by shrinking markets at home, Minolta, Canon, Sanyo and others finally are joining the rush to slash labor costs and get closer to consumers. Reflecting the trend, Japan's trade with China soared 30% to a record \$39 billion in the first six months of this year from the same period in 1999, the Japanese government says.

Promise, pitfalls of interactive TV

SAN JOSE, Calif. (AP) - America Online Inc.'s pending takeover of Time Warner Inc. promises to create unmatched cross-marketing muscle. And with such promise often comes pitfall, and in a marriage like this, the biggest pitfall could be consumers themselves. AOL's game plan in acquiring Time Warner is simple: Use any and every means to grow its subscriber base - currently 25 million in the United States - by leveraging Time Warner's mighty portfolio of news, entertainment, broadcasting and cable TV holdings. But will consumers truly crave interactive TV, the new media product expected to be the most valuable fruit of this and other similar unions? Will they be willing to pay much for it? And will the programming be as laced with advertising as what they're now watching? The answers are as unclear today as the nature of our digital entertainment and information future. Some important indications, however, can be divined from how the AOL-Time Warner union, now under the scrutiny of federal regulators, looks to be shaping up.

British retail chain faces hardship

LONDON (AP) - Profits are down again at Marks & Spencer PLC, Britain's best-known retail chain, and the company is struggling to find the right mix of innovation and old-time values to ensure its survival, its chief executive says. "If we want to have a long-term future, we know that we have to deliver results soon," chief executive Luc Vandeveldt told a news conference Tuesday. Vandeveldt's blunt talk suggests that M&S, which owns the Brooks Brothers clothing chain, has at least identified its problems and is taking action to solve them. The results are starting to show. Customers used to frumpy, one-style-suits-all women's underwear can now choose from a wide

range of altogether sexier lingerie. Stores boast trendier lighting and displays, and the company has hired a marketing director for the first time in its 116-year existence. Most tellingly, perhaps, is that its stores finally began this spring to accept non-M&S credit cards.

Polo Ralph Lauren to unveil Website

NEW YORK (AP) - When it comes to e-commerce, Ralph Lauren doesn't just want customers to buy a pair of chinos. The designer wants to have them literally set foot into his lush world of country club chic, from booking a trip to Little Palm, an exclusive island in the Florida Keys, to chatting with actress and company spokes model Penelope Cruz online. Polo.com, to be unveiled Friday with 2,500 styles under the Polo and Ralph Lauren brands, represents the first offering from Polo Ralph Lauren Media, a joint venture formed last February by Polo Ralph Lauren, NBC, and NBC affiliates Value Vision International Inc. and NBC Internet Inc. Polo.com is designed to be more than just an e-commerce site, according to Jeff Morgan, president and chief executive officer of Ralph Lauren Media. With the much anticipated launch, Polo Ralph Lauren will be the first among the pack of major high-end designers to stake a claim in e-tailing.

Lucent plans job cuts

TRENTON, N.J. (AP) - Lucent Technologies, stung by a string of disappointing profits, plans to streamline its upper management, enhance employee incentives and eliminate what analysts say could be as much as 10,000 jobs, or 10% of its work force. A spokesman for the telecommunications equipment maker, said Wednesday the company has already

eliminated 240 finance and human resources jobs this month, but has not determined the total number of cuts companywide. Most of the job losses are expected to come through attrition. While Lucent wants to shed some positions in optical data networking, software and other areas, the company has established new incentives to hire and keep outstanding employees. They include giving managers more discretion to hand out perks such as stock options and paying bonuses on a quarterly, rather than yearly, basis. Lucent also streamlined its top executive positions to speed decision-making. Shares of Murray Hill-based Lucent recently hit a two-year low after the company warned for the fourth time this year that profits once again would not meet expectations.

Women make way into corporate ranks

NEW YORK (AP) - Women are slowly making their way into the corporate ranks at Fortune 500 companies, according to a survey released Monday by a women's advocacy group. The study by the New York-based Catalyst found that 1,622 women are among the 12,945 corporate officers in the nation's 500 largest companies, or 12.5%. That's up from 11.9% last year and 8.7% in 1995. The latest figures also show a modest increase in the number of women in "line" positions - those who run the factories, head the sales staffs, and supervise the accounting - which tend to feed senior management positions. There, the number of women rose to 7.3% from 5.3% in 1997, the first time Catalyst started compiling this particular data. Despite the advances, there still are 90 Fortune 500 companies that have no women corporate officers, according to the survey, which was based on corporate records filed by March 31. Fifty of the top 500

companies, or 10%, have given a quarter or more of their corporate officer titles to women. That's twice the number of 1995, but still a relatively low rate given that women make up more than 46% of the nation's labor force.

New life coaxed from dead brains

NEW ORLEANS (AP) - Scientists have coaxed new life out of dead brains. It turns out that even cadavers can supply the incredibly versatile brain stem cells - master cells which can turn into different kinds of brain and nerve cells - once thought available only from fetal tissue. So can skin. And it appears that just about every bone stem cell can be tweaked to produce brain cells. Several reports to the Society for Neuroscience seem to offer yet more possible solutions to the ethical dilemma blocking stem cell studies which use human fetal tissue. But they are not yet solutions and may never be. There are big differences among stem cells from embryos, from fetuses and from adult tissue, and scientists don't really know much yet about any of them, they said.

L.A. cable firm drops sex channel

LOS ANGELES (AP) - The largest cable operator in the nation's second-largest city has dropped its only pay-per-view sex channel. Adelphia Communications, which has about 1.2 million subscribers in Los Angeles and Orange counties, completed phasing out the popular Spice channel with the Health Network this fall. Adelphia is run by a conservative Pennsylvania family. John Rigas, the company's 75-year-old patriarch, opposes adult programming, which he believes undermines family values. Adelphia's decision to eliminate pay-per-view adult fare runs counter to industry trends. Revenues from sex channels

doubled in the last three years to more than \$500 million this year. Paul Janis of the city's Information Technology Agency said that a handful of Adelphia customers had complained about the removal of Spice. Adelphia is the nation's sixth largest cable television operator with about 5.6 million subscribers.

Venture capital flow changing

SAN FRANCISCO (AP) - Despite mounting pressure to stem the flow from their financial spigots, venture capitalists poured \$16.1 billion into startups in the third quarter, with most of the money streaming into Internet-related business. The venture capital flow hardly qualifies as a drought, but virtually everyone connected to the industry agrees the pattern of investment has changed drastically, moving away from e-commerce businesses focused on selling products and services to consumers and shifting toward startups that are devoted to making the Internet run more smoothly. Total venture capital investments for the three months ending Sept. 30 dropped 6% from the \$17.2 billion committed in the second quarter, according to data released Wednesday by industry research firm Venture One. About 81% of the venture capital money went into start-ups whose business plans revolved around the Internet. It marked the second consecutive period that venture investments tracked by Venture One have declined from one quarter to the next, suggesting the financial frenzy revolving around Internet startups has peaked.

Retailers to battle in Cyberspace

NEW YORK (AP) - When it comes to e-commerce, traditional discounters are no longer waiting in the wings. After several failed makeover attempts, Wal-Mart Stores

Inc., the world's largest retailer, is making a big play to be as much of a powerhouse online as it is offline, reopening its newly renovated site Tuesday. Meanwhile, Target Corp. unveiled its own redesigned site last Friday, boasting better graphics and an improved search engine. And Kmart Corp. this week officially flashed its Bluelight.com site, after quietly launching it in June. With an increasing number of mainstream consumers becoming Web savvy - a projected 51% of all American households are expected to be online this year, up from last year's 45%, according to New York-based Jupiter Communications - these discount behemoths aim to seize a larger share of the e-commerce pie. Their big push for online shoppers comes as e-tailing veterans like Amazon.com Inc. and eToys Inc. have been pounded by investors, while a slew of other online operations have shut their doors.

Low-Price, Highly Ambitious Digital Chip

September 11, 2000

By JOHN MARKOFF

Peter DaSilva for The New York Times

Foveon's chip shown with a prototype camera using the new technology.

Suddenly the future of digital photography seems to be becoming much clearer.

Only two weeks ago, Eastman Kodak announced a chip able to capture digital images with a resolution of 4,096 by 4,096 picture elements — or pixels — per square inch. That, by some measures, is about twice the resolution of 35-millimeter film.

Today, a company founded by one of Silicon Valley's pioneer chip designers, will announce an image-sensing chip capable of the same

resolution as the Kodak chip, but made using a technique that could be much less expensive.

Executives of the company, Foveon, said they had given a prototype camera based on their chip to a photographer in Los Angeles, Greg Gorman, who had used it to make a portrait of a cowboy. In that image, no pixels, or dots, were visible to the eye, even with the photograph blown up to a size of 8 feet by 4 feet.

Already, digital cameras being sold on the consumer market for less than \$1,000 are rivaling 35-millimeter film cameras. Digital images of the clarity achieved with Foveon chip could begin to challenge even the much more expensive 4-by-5 film cameras made by companies like Hasselblad that are used by professional photographers for portraiture, advertising and fashion.

"We're headed to flat-out replace the film camera," said Carver Mead, the founder of Foveon, which is based in Santa Clara, Calif. Mr. Mead, a pioneer of the chip industry, became a Silicon Valley legend in the 1970's by helping develop techniques that for the first time enabled chip engineers to create circuits containing tens of thousands of transistors.

Industry analysts say that the new technologies could affect much more than still cameras. High-resolution images, if produced in quantities that made the new generation of image-sensing chips cost only several dollars apiece, could become a staple of cellular telephones and other hand-held devices and might bring the cost of a consumer video camera below \$100.

And the contest is not only between film and digital sensors, but between two kinds of chip-making techniques. Foveon's planned announcement, coming on the heels of Kodak's,

suggests a sharpening battle between the two competing manufacturing technologies at the heart of a billion-dollar market for digital photographic sensors.

The Foveon chip is based on a low-cost semiconductor industry technology known as Complementary Metal-Oxide Semiconductor, or CMOS (pronounced SEE-moss). The Kodak chip's sensor is based on a more expensive manufacturing technology known as Charged Coupled Device, or C.C.D. imaging.

C.C.D.'s now dominate the digital-imaging industry, but compared with CMOS devices, they require production and assembly of several chips and related components to combine the sensing and computing tasks that can be performed by a single CMOS chip.

Both companies' achievements have startled industry experts because the new devices move far beyond the current industry standards for CMOS and for C.C.D. cameras, which until now have been able to achieve resolutions of 6 million pixels a square inch. The Foveon and Kodak sensors can pack 16.8 million pixels into a square inch.

"If you asked someone if this was achievable in either technology two weeks ago, they would have said it was impossible," said Michael Berger, an industry analyst at Frost & Sullivan, a market research firm in San Antonio.

The Foveon announcement is seen as a personal triumph for Mr. Mead, 66, who is regarded by many executives and engineers as the father of the modern semiconductor industry.

"Carver has tapped into something enormous," said Alexis Gerard, president of Future Image Inc., a digital-imaging research and consulting firm in San Mateo, Calif. "When digital imaging and the telecommunications

infrastructure converge, they will enable a shift from a text-based communication model to an image-based model."

Throughout his career Mr. Mead has explored the idea of duplicating the human senses, including vision and hearing, by using silicon-based chip technologies. Several years ago, his earlier work led to the development of a smaller and more effective hearing aid now sold by Sonic Innovations of Salt Lake City.

Complex chips first became feasible in the 1970's after Mr. Mead, at the time a professor at the California Institute of Technology, teamed up with a Xerox computer scientist named Lynn Conway to invent a technique for placing thousands of transistors on a chip — a technique known as Very Large Scale Integrated Circuit, or VLSI design.

Today, CMOS-based manufacturing — which is used to carry out VLSI design — is employed by virtually all microprocessor and memory makers. As a result, it has become extremely cost-efficient and can yield circuitry with more transistors and lower power requirements than most competing technologies.

Yet despite their promise, CMOS-based sensors have until now had just a tiny impact on the overall market for digital imaging because they have been unable to achieve the resolution and clarity of C.C.D. sensors. The global market in 1999 for C.C.D. sensors was \$959 million, compared with only \$14.2 million for CMOS sensors, according to Frost & Sullivan.

But even before Foveon's latest achievement, CMOS was gaining ground. Not only have companies including Kodak and Polaroid begun to offer inexpensive, low-resolution CMOS-based cameras, but telecommunications giants

like Nokia of Finland and NTT DoCoMo of Japan are planning to include inexpensive CMOS sensors in millions of their next-generation cellular phones.

Foveon's contribution has been to improve the quality of CMOS images by continuing to put more computer processing power behind the task of capturing the digital image. The new 16.8 million pixel device has seven active transistors for each pixel. The benefits include less interference, better focusing and more precise exposure times. "When the pixels get smarter," Mr. Mead said, "that translates into better image quality."

Foveon's principal investor and the company's technology partner is National Semiconductor, a big Silicon Valley chip maker.

National Semiconductor's manufacturing plant in Santa Clara is capable of etching chip circuitry only 0.18 micron wide — a microscopic fineness that few other chip makers can equal. By contrast, most current low-cost CMOS sensors are made with circuitry of 0.35 or 0.5 microns, which allows for millions fewer transistors per chip.

National Semiconductor executives said the company was planning to take the technology that Foveon had developed for the priciest reaches of the professional photography market and make it economical enough for some new consumer electronics.

"National's interest is not in thousands of cameras a year but in hundreds of millions of cameras a year," said Brian L. Halla, the company's president and chief executive. "We could make the world's highest-resolution throwaway digital camera and sell it for the price of a similar Kodak system."

Foveon officials said they would demonstrate the new 16.8 million pixel sensor for the first

time today. The sensor, which for now captures images in black and white, has almost 70 million transistors — or about two and a half times the number of transistors used by a Pentium III microprocessor chip for computers. Foveon says it expects the new sensor to be on the market within a year.

Currently, Foveon sells a high-end camera using an earlier version of its sensor that has a resolution of 2048 x 2048 pixels, or 4.19 million in all. That camera uses three separate sensors and a prism array to separate color information. But Mr. Halla said the company was also working on a technique that would permit a single chip to capture precise color information.

Despite the advances now being made, Mr. Mead acknowledged that digital-image sensors are still a long way from matching the skills of the human eye.

An eye is movable, which enables it to scan various parts of an image and then allow the brain to compose a single, larger image. The eye is also remarkably diverse: elements that have high resolution are clustered at the center of the field of vision, while sensing elements that function well at low light levels are around the periphery of the eye, giving human vision a great flexibility of range in varying light conditions that no artificial imaging system can yet match.

Mr. Mead said that because of fundamental size limits in the wavelengths of light, it is unlikely that future digital sensors will gain much additional resolution. Instead, shrinking semiconductor circuit sizes will make it possible for companies like Foveon to add more and more intelligence to their digital-imaging systems, perhaps simulating more of the image-enhancement functions of the human brain.

Hewlett-Packard unveils new look

LAS VEGAS (AP) - Hewlett-Packard CEO Carly Fiorina unveiled her vision Monday for transforming the company from a product-driven colossus to a pioneer of Internet services and ideas, a change that will be highlighted by a \$200 million marketing campaign. Fiorina, a former Lucent Technologies executive hired in July with the goal of reinvigorating the 60-year-old company, told attendees at the giant annual Comdex fall computer show that the Palo Alto, Calif.-based giant will return to its roots - that of being an inventor and innovator. The company unveiled a marketing campaign that will emphasize the Palo Alto garage in which founders Bill Hewlett and Dave Packard turned out their first product, an electronic instrument used to test sound. Its new logo will be "HP: Invent." See <http://www.infobeat.com/stories/cgi/story.cgi?id=2562098529-07f>

Re: HP Split

H-P yesterday unveiled plans to split into two companies -- one for its main printer and computer businesses and the other for medical devices and electronic testing equipment. The move is designed to boost printer profits and revive computer sales by stripping away the slower-growing businesses.

To be sure, either of the new companies will be able to do what it wants once the two are separate. On a call yesterday with financial analysts, H-P didn't rule out the possibility of more spinoffs, although none are in the works now.

Re: The search for a new CEO (company apparently lacks people with the right mental patterns)

Some observers say that computer experience isn't a prerequisite -- just as Gerstner came from consumer company RJR Nabisco Corp. to run the world's largest computer maker.

An executive with good "strategic" skills could put together a wide-ranging strategy on one of H-P's biggest priorities -- providing computer services linked to the Internet, said Duane Eatherly, a senior technology analyst with Banc One Investment Advisors, which owns 1.25 million H-P shares.

Travel agents struggle to survive

CHICAGO (AP) - Travel agent is not yet an endangered occupation. But with Internet competition and other changes rocking the industry, those who can't adapt are fast going the way of the door-to-door milkman. "I wouldn't recommend it to my children or grandchildren," says Joe Vendi, owner of the Miami agency Travel Is Fun, referring to the travel agency business. Despite the booming growth of leisure travel, hundreds of agencies - those with offices rather than Web sites - have gone out of business nationwide as travel agents struggle to survive the one-two punch of airline commission cuts and online competition. On Chicago's North Side, longtime agent Josie Stachurski has seen five or six other agencies within a 10-block radius vanish. See

<http://www.infobeat.com/stories/cgi/story.cgi?id=2562100067-8a7>

Simplicity and Power Are Driving Data Delivery

By SETH SCHIESEL

July 27, 2000

For a glimpse of the telecommunications industry's probable future, visit the 22nd floor of the cavernous networking center at 60 Hudson Street in Manhattan.

In one corner is a rack of equipment from Lucent Technologies transmitting 10 billion bits of information a second over optical fiber in one link and 2.5 billion in another for Deutsche Telekom. That's impressive. But just a few feet away is a small purple box made by Cyras Systems, a California start-up, transmitting 40 billion bits a second for the German company.

Then go uptown to Rockefeller Center, to NBC headquarters. There, on the ninth floor, are perhaps millions of dollars' worth of Internet routers from Cisco Systems. And next to them, sitting no more than 18 inches high, is a cobbled-together system using gear from Lucent and others that cost no more than \$100,000 and is transmitting more than 750 million bits a second of television to Nippon Television across the street and Court TV across town.

These striking examples of next-generation technology are brought to you by an unlikely sponsor, a small private communications carrier run by a former executive of Qwest Communications International and based in Hackensack, N.J. It is called Enkido Inc.

Who? That is just the reaction of many people who work in communications. But without fanfare or high-profile venture capital, Enkido, which makes no equipment itself but is audacious in the technology it uses, may provide the best look at what communications networks will look like in five years: cheaper, simpler, more powerful.

Of course, Enkido itself may not survive that long. In its embrace of the networking world's

sharpest cutting edge, it could easily begin to bleed. But the place that Enkido (pronounced en-KEY-doh) and its chairman, Nayel Shafei, are trying to reach today is just about where most communications companies expect to end up.

Hans Roeterink, chief technology officer for Deutsche Telekom's North American operation, said Enkido had recently provided his company "an OC-768 connection" in New York. "The connection was completed ahead of schedule and has been successfully in operation," he said.

OC-768 is telecommunications shorthand for 40 billion bits a second. At a time when the quickest traffic flows supported by the most advanced civilian networks are 10 billion bits a second, it means Enkido may be running the fastest commercial network connection anywhere.

In the entire high-technology world, there is probably no more fevered sector than optical communications. Each week, it seems, brings the story of a small private optical equipment company, unknown outside the industry, being acquired for billions of dollars by Lucent, Cisco or Nortel Networks of Canada. Then there are the public companies. Earlier this month, in what appeared to be the biggest technology deal yet, JDS Uniphase agreed to spend \$41 billion to acquire the hitherto-obscure SDL Inc., which makes lasers and other components for optical systems.

The reason the optical arena is so hot is simple. The growth of the Internet and other data communications has placed unparalleled demands on the communications infrastructure. Not only must rafts of additional capacity be built into networks, but those networks must be reconfigured to carry communications traffic in different ways. A network

structure that works well for voice telephone traffic may prove horribly inefficient at carrying data.

So carriers ranging from grand dames like AT&T to debutantes like Level 3 are spending billions on advanced optical gear and other equipment often meant to make the best use of their networks for data traffic.

But perhaps no company has been as aggressive in deploying next-generation technology and embracing futuristic network designs as Enkido. In fairness, Enkido has the luxury of serving only a handful of customers, allowing it to use less proven systems. Bigger carriers have to worry more about reliability and by necessity are more conservative in their network design.

But companies like Deutsche Telekom and NBC have turned to Enkido for parts of their business because Enkido has delivered big communications pipelines quickly and cheaply. The Naval Research Laboratory in Washington, an agency of the Defense Department, is working with Enkido as it tries to jump-start the next generation of optical networks in connection with the Defense Advanced Research Projects Agency, or Darpa.

"We're not trying to pick winners; we're trying to deal with anyone who can provide some sort of capability," said Hank Dardy, the laboratory's chief scientist. "I don't know where Nayel's going totally, but he's helped to coordinate several things for us in terms of getting us the right components and connections for the bandwidth we need."

At a certain level of abstraction, it's fairly simple to describe where Mr. Shafei wants to go.

"Big fat pipes for big fat customers, that's our business," said Mr. Shafei, who until the

spring of 1999 was an executive vice president at Qwest. "When I left Qwest, I said, 'I can put together an end-to-end network, both long-haul and local loop, that will be competing only with Fed-Ex, taking packets door-to-door.' "

That sounds awfully similar to a lot of companies out there, companies that have far more extensive networks. But it is the way Enkido is pursuing its vision that makes it interesting.

First, a bit of background. Most communications networks today are a jumble of languages and systems. These different protocols and technologies are generally layered upon one another, or within one another. Imagine a shipment of vases from London to New York. The vases may be packed into crates, the crates placed into a shipping container and the container put on a ship. The vases are all the customers in New York care about, but the crates, container and ship are all required to get them there safely.

Now think of optical fiber cables and the equipment that lights them as the ocean. In most traditional communications networks, the role of the ship is played by a technology known as Sonet, for synchronous optical network.

Sonet is reliable, but it can also be inefficient, not only because a significant amount of communications capacity must be set aside for "protection" in case of a failure, but also because at the most basic level Sonet packages information in envelopes of 52 million bits of information a second.

On top of Sonet, many carriers deploy a technology known as A.T.M., for asynchronous transfer mode. Think of A.T.M. as the big containers. Containerizing was a revolution for shipping because containers' uniform size

allows them to be shipped easily around the world, by boat or train, without regard for what is inside. A.T.M. performs a similar function by packaging voice, video or data communications into uniform "cells" of 53 bytes each.

And then, within the shipping containers, within the A.T.M. cells, are the actual services that people use: telephone calls, Internet services, or other data services. There are obviously many other ways to configure a network, but many if not most of North America's big carriers use or are moving to this structure of services.

Put simply, what Enkido wants to do is eliminate the A.T.M. and Sonet layers, which seems perhaps like the equivalent of throwing those crates of vases into the Thames and expecting them to wash up in Manhattan in two days. If it works, huge costs and complications have been avoided.

It sounds crazy, but that is just where many communications experts expect the networking world to end up, with some of the many communications languages becoming extinct or being radically modified and Internet protocol eventually riding directly over wavelengths of light.

"If I were starting now I would go straight to I.P.," said Pushendra Mohta, a former AT&T vice president who is now an entrepreneur-in-residence at Benchmark Capital, the prominent venture capital firm in Menlo Park, Calif., and who is just starting a new wireless data company. "If I were starting something now I would make that bet, to get up straight onto wavelengths."

Muayyad Al-Chalabi, director for core communications switching analysis at RHK, a consulting firm in South San Francisco, Calif.,

said: "The direction is higher and higher speed and elimination of layers. There's no question about that. The question is who can support millions and millions of users."

And it is there, in the question of what communications executives call "scalability," that Enkido may face its biggest challenge. It is easy running what some might call a science project of a network when you have only a handful of customers. But when the number of customers takes on a fair number of zeroes, the technology must often be robust enough to take care of itself.

For now, Enkido is aiming at the fattest of customers: financial services firms, entertainment companies, other carriers and the government.

After leaving Qwest last year, Mr. Shafei put a few million of his own dollars into starting the company and then began approaching prospective customers and companies that could sell him raw optical cables across the nation and within the New York area.

With the money he got up front from customers, led by NBC, he was able to begin buying space for Enkido on optical cables owned by a panoply of local utilities and by companies running cables across the continent.

This year, Mr. Shafei expects Enkido to generate more than \$50 million in revenue. As advisers he has signed up Raj Reddy, a professor of computer science at Carnegie Mellon University and co-chairman of the President's Information Technology Advisory Committee, and Robert E. Kahn, who spent 13 years at Darpa before becoming president of the Corporation for National Research Initiatives, a nonprofit research group in Reston, Va.

More than 90 percent of Enkido's equity, however, remains with Mr. Shafei. And he does not intend to share any of it with venture capitalists, whom he views derisively.

"Why on earth do I need to go have a monkey sitting on my shoulder, telling me 'Do this, do that,' and they don't know anything about the industry," Mr. Shafei said. "I'm not a miser with equity, but I don't like monkeys."

Instead, Mr. Shafei says he has arranged a line of credit from commercial banks worth \$100 million to \$200 million and added that he would consider offering high-yield debt financing, or junk bonds, in the future.

In his financial plans, as in his technical ones, Mr. Shafei is taking the path untrodden.

"You have dinosaurs out there in this business, and then you have dinosaurs with space helmets on, but they're still dinosaurs," he said. "We're a whole new breed in the evolution ladder. We have five fingers and five toes."

DaimlerChrysler's Chief Defends His Strategy

By EDMUND L. ANDREWS

December 2, 2000

R. Kwiotek for The New York Times

"What I want people to understand is that the operational issues have nothing to do with what I term an absolutely perfect strategy."

STUTTGART, Dec. 1 — Jürgen E. Schrempf, chief executive of DaimlerChrysler, was not about to make apologies.

Grappling to end — or at least slow — the huge losses at Chrysler, and the plunge in DaimlerChrysler's shares, the usually exuberant Mr. Schrempp was grim but unrepentant as he reflected on his troubles in his office here today.

His strategy, he said, is still "perfect" and merely needs "operational implementation." He will not resign. He will not even consider the idea of spinning off Chrysler, in whole or in part.

And even though most of Chrysler's top management has either quit or been fired, and the hostility from Chrysler workers in Michigan is intense, Mr. Schrempp said he regretted very little.

"Yes, the performance of Chrysler is at this moment not what we expected," he said. "But what I want people to understand is that the operational issues have nothing to do with what I term an absolutely perfect strategy."

Mr. Schrempp is no newcomer to tough situations, but even he will have a hard time surviving this crisis. What seemed like a brilliant merger between Chrysler and Daimler-Benz two years ago has, seemingly overnight, started to look like a fiasco. DaimlerChrysler shares have lost well over half their value since January 1999, a decline of more than \$60 billion in market value, closing today at \$39.75, up \$1.31, in New York trading.

And today was another bad day. Chrysler, now being run by Mr. Schrempp's trusted lieutenant, Dieter Zetsche, reported that its American sales slumped 5 percent in November after dropping 8 percent the month before. The company also announced that it would temporarily shut 7 of its 12 factories.

The strain of recent events — including a flurry of new shareholder lawsuits — has taken a toll on Mr. Schrempp. Though tanned and seemingly rested, he abandoned his gregarious humor and seemed as tightly coiled as an overwound watch.

"I don't think there is anyone in the world who is free of mistakes," he said. "Most certainly, I am not."

But when asked whether Daimler's German executives had failed to understand Chrysler's culture or the nature of its American business, Mr. Schrempp was icily distant. He referred to Chrysler as a "division" and irritably brushed off further questions about culture.

"Our management style is to give divisional leadership the maximum freedom," he said. "That has always been our management style and was also our management style in the case of Chrysler. That is my answer to that one."

Asked whether he had thought about resigning, he implied that the answer was no but seemed evasive.

"I keep my eyes on the business I have to perform," he answered, adding that he had to get past difficult times when he took over as chief executive of Daimler-Benz when it was hemorrhaging money in 1995.

"Someone who can only perform during good times and when times get tougher loses the nerve to do the job, that person has a problem," he said. "It doesn't apply to me."

It is hard to overstate the challenges that confront Mr. Schrempp. Data released today about automobile sales in the United States reinforces worries that Chrysler's problems could get a good deal worse before they get better.

Chrysler was already losing ground to competitors, but a steep decline in the market as a whole would expand Chrysler's third-quarter loss of \$512 million into a loss of well over \$1 billion next year. Until recently, Chrysler accounted for about half of DaimlerChrysler's overall profit.

Mr. Schrempp is clearly bracing for a broader downturn in the American car market. "I'm not speculating about 2002, but I think that 2001 will be lower," he said. "And even those record numbers in 2000, in my opinion, were partly inflated by incentives" — rebates and financing discounts offered to car buyers.

Mr. Schrempp has already admitted that Chrysler will fall short of expectations in the fourth quarter, and most analysts predict the operation will run another significant loss.

Mr. Schrempp said today that Chrysler would "contribute marginally to the overall group performance" for the full year 2000. But that is quite ominous, because it suggests that most of Chrysler's profit from the first half will have been wiped out by the second half.

That will put a huge dent in the parent company's profitability. Mr. Schrempp said DaimlerChrysler's profit would be about 10 billion euros (\$8.7 billion) for all of 2000 — about the same as 1999 — but that estimate includes big one-time gains from the spinoff of Daimler's aerospace unit and other assets.

Mr. Schrempp offered few hints about the kind of restructuring that Mr. Zetsche is likely to propose for Chrysler, saying only that it was necessary to look at the "entire value chain" from development through marketing and distribution.

Daimler executives are convinced that Chrysler lost control of its costs in the last two years, and they suggest that there are big

potential savings in development costs if Chrysler adopts more Mercedes components that would be invisible to customers. One example they cite is Mercedes' axle assemblies, which Chrysler could install in its relatively small number of rear-wheel-drive vehicles.

There has been widespread speculation about deep cost-cutting in Chrysler development programs, and the possibility of eliminating some new models. But executives here in Stuttgart readily acknowledge that Chrysler needs exciting new products to regain its health — and that takes money. And while Chrysler's profit has in the last few years come almost entirely from light trucks, sport utility vehicles and minivans, Daimler executives say they are not writing off cars.

But Mr. Schrempp has to worry about more than just a turnaround at Chrysler. Thanks to some supremely ill-chosen remarks in an interview with *The Financial Times*, in which he suggested that the "merger of equals" was merely a ruse to disguise a de facto takeover, he and Daimler have been sued by the company's third-largest shareholder, Kirk Kerkorian. A growing number of copycat suits have followed.

Mr. Schrempp, citing lawyer's orders, would not comment beyond a brief written statement that the "current organization of DaimlerChrysler is the most adequate to address business conditions."

Mr. Zetsche is under orders to have a turnaround plan by February. In the meantime, Mr. Schrempp must appease both angry shareholders and demoralized workers.

For all the complaints in Detroit about being overrun by executives from Stuttgart, Mr. Schrempp had little to say about assuaging

wounded pride. "I have the distinct feeling that what will convince them is performance, internally and externally," he said. "As soon as we have the right plan, and we believe it will turn the company around, I think morale will speedily improve."

The Virtual Classroom Vs. The Real One

http://www.forbes.com/bow/2000/0911/bestofweb_print.html

INVESTORS ARE POURING MILLIONS, soon to be billions, into the online education market. Conservative figures from analysts at Thomas Weisel Partners, a merchant bank in San Francisco, estimate a \$10 billion virtual higher-ed market by 2003 and an \$11 billion corporate-learning market by the same year. That's \$21 billion from almost nothing and it's the kind of market that makes venturesome investors drool. John Chambers, the highly esteemed CEO of Cisco Systems, calls online education the "killer app" of the Internet.

Here are some of the big players in Web education. Michael Milken, his brother Lowell and Oracle's Larry Ellison run Knowledge Universe, a venture hatchery for educational and training companies.

Washington Post Co. is knee-deep in ed-ventures including KaplanCollege.com, which offers 500 online courses across nine professions.

Wall Street magnate Herbert Allen of Allen & Co. has earmarked \$20 million to launch and sustain Global Education Network (GEN), a clearinghouse of courses from America's top colleges: Brown, Wellesley and Williams among them. The site, poised to be the first elite education provider online, will be tested this fall.

Meanwhile, at least in higher education, the Establishment is moving quickly to embrace the Internet. In December 1999, the National Center for Education Statistics (NCES) of the U.S. Department of Education (USDE) released a new national survey on what it calls

"distance learning" in higher education. In 1997-98, almost 44% of all higher education institutions offered distance courses. Larger institutions are moving fastest: 87% of those with more than 10,000 students offered distance classes, while only 19% of institutions with fewer than 3,000 students did so.

Total enrollment in postsecondary, credit-granting distance learning courses in 1997-98 was 1,363,670; the number has grown considerably since, although as yet there are no firm figures.

Significantly, almost all the growth was in courses that used the Internet, rather than TV, to bridge the distances.

This is no fad. It is rather a stampede and nothing can stop it. Online education is convenient (no moving, no commuting, no leaving the house even) and collaborative (students in China and Minnesota can work together on presentations). Teaching institutions can reach many more students without having to expand their physical plants. With its vast bag of technological tricks, the Web can offer a multimedia approach potentially equal to the very best-equipped classrooms in the world.

Globally those conveniences have even greater impact, particularly in Asia, Africa and Latin America, where more than two-thirds of citizens are under 20 years old. Without training these kids cannot become assets in a modern economy. But where are these developing countries to get the necessary money using conventional classroom education?

Though Web education is in its infancy, listen to professor Roger Schank, a computer scientist at Northwestern University who runs an online learning outfit called Cognitivearts.com. "We are witnessing the

dawn of a new era in education. In the beginning it will look a lot like what it is replacing, just as early movies were simply filmed plays.

“But like the movies, online education will evolve into something very different from what now exists. We are at the beginning of something very exciting.”

For every student who gets into Harvard, a hundred more could handle the work. Why should they be denied?

“We are undertaking a social experiment on the grandest scale,” says Doug Levin, a senior research analyst at the American Institute for Research. Levin has been researching technology for the Department of Education since 1995. “There is every reason to believe that it [online education] is something we should be doing ... but you have to recognize that we are inventing this as we go.”

Prof. Schank says, “new online courses will be so exciting students will demand them.” Maybe in the future, but for now it is generally agreed that attrition rates from online schools are higher than from traditional schools. Vicky Phillips, founder of Geteducated.com, a consulting agency for distance educators, estimates the online student dropout rate at around 35%. The average attrition rate for college freshman at U.S. universities is around 20%, Phillips says. The fact is, much of what passes for online education today would put most of us to sleep.

New techniques are being developed and right now every e-learning company and university has a different idea about how to use the Internet.

Western Governors University (www.wgu.edu/wgu), for example, assigns students “mentors” who act as guides through

the school’s academic programs; e-mail and telephone connect student to mentor and student to student. Courses are downloaded through RealPlayer, PDF file, and a vast library database designed by the university.

By contrast, students in the University of Illinois Curriculum, Technology and Education Reform master’s program (www.ed.uiuc.edu/ed-online/cter) receive assignments from a slate of professors, track those assignments through a university-generated database, and hold asynchronous threaded discussions--they don’t have to be online at the same time--and real-time chats through WebBoard 2.0.

Even with high-tech tools, the conversion of curriculum from classroom to Internet is not easy or intuitive. “It is vastly harder than preparing a classroom course, 20 times the effort,” says Eli Noam, professor of economics and finance at Columbia Business School.

One of the reasons it is harder is that online students face more distractions than do students in a classroom. “You have to script it very carefully.” He knows he’s competing with wine, crying children and prime-time TV.

His lecture materials are accompanied by 150 slides, a recorded soundtrack, video and photos of himself in lecture poses. Noam has even played with the idea of planting online ringers to spur discussions and debate.

“People tend to lose interest if there’s nobody on the other side who cares if I’m here or not,” remarks Geteducated.com’s Phillips. “That’s where we’re getting dropouts.”

GEN’s backer, Wall Street magnate Herb Allen is aware of the difficulties. For the newcomers to compete with established educational institutions on the Web, private capital must bring needed innovation to the

educational process. "The question we will continue to ask is: Can we [GEN] make it better than sitting in English 101 at Williams?" If not? "If we don't get the quality we want, we'll shut it down."

Thomas Kalinske is CEO of Knowledge Universe, the Milken/Ellison-financed agglomeration of more than 40 e-learning companies. Kalinske claims his people have figured out how to make online learning more "enjoyable and exciting" than it was a few years ago when hyperlinking lecture notes seemed like an innovative idea.

Kalinske points to Unext, a Knowledge Universe holding: "The knowledge transfer is done in such a way that they know that the individual is grasping it. Students are constantly being assessed. That's why we're so confident." For example, Unext's technology can detect if one student is learning faster through formulas and one through video presentations. It then tailors the coursework to each student.

The one segment of the online education market that seems to be moving the most confidently is corporate training programs. Most big companies are sold on the idea that continuous training and retraining of employees pays off big. For the average company, use of e-learning is 50% to 90% cheaper than bringing in real-life teachers and holding formal classes.

Keith Gay, the Thomas Weisel security analyst, says corporate learning companies are starting to attract big dollars. He points to two e-learning companies he thinks have great potential: SmartForce and DigitalThink. Both create software that companies can use to establish online training coursework. At the end of 1999, SmartForce signed a \$25 million deal with Unisys. Earlier this year,

DigitalThink, whose clients include Cisco Systems, Charles Schwab and Deutsche Bank, recently inked a deal with EDS for \$50 million.

Before this is over, big money is going to be lost and maybe some will be made, but education will never be its old rigid and formalized self. No longer will a handful of admissions officers in their self-righteous wisdom be the sole guardians of the gates to the best in education. For every student who gets into a Harvard or a Princeton or a Berkeley there are probably a hundred who could handle the work. Why should they be denied the opportunity?

We'll let the articulate Professor Schank have almost the last word: "Students will be able to shop around, taking a course from any institution that offers a good one. Degree-granting institutions will have to accommodate this.

"They will resist at first, but eventually society will realize that anyone is entitled to the best courses, and barriers will fall. Quality education will be available to all. Students will learn what they want to learn rather than what some faculty committee decided was the best political compromise.

"Education will be measured by what you know rather than by whose name appears on your diploma." If the Internet can facilitate this kind of change, we can only say, Amen.

Educators' Approach to Technology Funding Matures

By REBECCA S. WEINER

November 28, 2000

In what experts hail as a sign that schools are approaching technology funding in a more

mature fashion, educators are carving out space in their budgets for hardware, software and training instead of relying on donations and grants.

Investing in technology is “becoming more institutionalized,” said John Vaille, CEO of the Oregon-based International Society for Technology in Education. Until recently, Vaille said, technology spending was largely the result of “individual school or teacher initiatives.”

As technology funding becomes more mainstream, the total amount being spent is also increasing. Market Data Retrieval, a Connecticut-based educational research company, recently found that public schools spent an estimated \$5.67 billion, or \$121.37 per student, on technology in the 1999-2000 school year. That figure is up 2.5 percent over the prior school year.

“They’ve shifted their views on how they acquire and maintain equipment,” said Kathleen Brantley, director of product development for Market Data Retrieval. “They’ve gotten smarter about budgeting for the long term.”

Keith Krueger, the executive director of the Consortium for School Networking (CoSN), said that as the costs of maintaining computers and networks grow, schools paying closer attention to their long-term technology budgeting. The Consortium has worked with schools to budget for what is known in the business world as ‘total cost of ownership’ - accounting for the initial purchase price, maintenance and replacement.

The idea is not a new one for educators. School officials have traditionally considered long-term costs when budgeting for new construction or purchasing new vehicles by

factoring in maintenance and replacement costs, Krueger said.

“All those pieces aren’t anything new,” he said. “But for many reasons we’ve thought of technology as an add-on; it’s been funded by grants and donations.”

What is true for hardware is also become true for training and curriculum. As the sophistication of school computer networks increases and demands on the technology grow, educators are finding that they cannot rely on volunteers and giveaways to flesh out their technology offerings.

“This ad hoc approach like Net Day, or doing something with [computer companies] or getting a free donation - they’re going to slip away because all kids are going to need access,” said Arthur Sheekey, technology coordinator for the Council of Chief State School Officers. “As the systems get more complicated, they can’t depend on the math teacher or a parent.”

Vaille said the systems have also become too complicated and too important for school leaders to depend on free labor.

“When it becomes mission-critical, you can’t rely on volunteers,” he said. “Those technologies have become integral and have become a line-item” in school budgets.

Schools have moved away from relying on grants and donations as the public money for education technology has increased. Federal education technology spending is estimated to reach \$1.5 billion this year, with much of that money dedicated to programs which require matching funds from states and local school districts. And while federal funds account for only about 7 percent of overall education spending in the country, the government’s

share of technology funding is nearly 35 percent.

One federal funding initiative, the e-rate program, has been particularly influential in helping to boost dedicated technology spending in schools, Brantley said. The program provides federal money to offset the cost of Internet connections and other wiring for schools and libraries.

Brantley said that this year's survey is the first to truly reflect the impact the e-rate program has had on technology spending. The program "forced districts to have a technology plan and update it more often," she said.

The detailed technology plan is a central requirement for schools participating in the e-rate program, which is overseen by the Federal Communications Commission and is funded through telephone company contributions.

"The e-rate is getting more states involved in looking at infrastructure and equity," Sheekey said, adding that technology is a way state officials can help reduce disparity between schools with low- and high-income students.

With educators taking a more mature approach to technology funding, Sheekey suggested that state officials will follow suit, using the state's purchasing power to help schools acquire more uniform technology.

"It's looking at this from a systems point of view," he said. "Increasingly the states will assume a much greater role. They can aggregate demand."

Xerox to Spin Off Company

December 6, 2000

By CLAUDIA H. DEUTSCH

The Xerox Corporation, its finances in chaos and its stock in free fall, plans to spin off a small company today that demonstrates that its technological prowess, at least, remains intact.

The company, Gyricon Media Inc., will make a flexible, paper-thin material that can be used to display computer-generated text.

Xerox expects one of Gyricon's first applications to be in helping create changeable signs for retail stores. For example, during the day, when homemakers are most likely to be shopping, point-of-purchase displays might feature families using a product. When office workers start filing in at night, the store manager would be able to hit a few computer keys and change the display to feature people in suits.

Some investors hail Gyricon's birth as a welcome respite from the unrelenting stream of bad news that has flowed from Xerox lately.

"It demonstrates that they do still have some technology franchise value, and that they can still commercialize a product," said Anthony M. Maramarco, managing director of the David L. Babson Company, an investment company that holds Xerox shares.

David R. Giroux, an investment analyst at T. Rowe Price Associates, a Baltimore money management firm with a small stake in Xerox, sees it that way, too.

"Maybe this can divert investor attention away from the doom and gloom surrounding Xerox," he said. "The market is saying the risk of bankruptcy is greater than the possibility of turnaround, but I think Xerox may still have a big portfolio of technologies and opportunities."

Gyricon's so-called electronic paper is impregnated with tiny balls that are white on one side, black on the other. When hit by a stream of electrons, the balls turn either their white or black face forward. The resulting black-white patterns are similar to the one-two digital patterns of the binary code that computers translate into visible text.

Brian Stern, president of Xerox New Enterprises, which commercializes noncore technologies that come out of the Palo Alto Research Center of Xerox, predicts Gyricon will earn "hundreds of millions in revenues" by 2004, and that Xerox will sell big chunks of equity in the company long before that.

Still, any cash generated would be too little and too late to ease Xerox's financial squeeze. On Friday, Moody's Investors Service downgraded Xerox's debt to junk bond status. The rating activated clauses in Xerox's debt agreements that could force it to buy back or refinance some \$425 million in debt. Xerox has only \$600 million left in a \$7 billion line of credit and, thus, could soon be out of money.

Investors seem to doubt that Xerox, which lost \$167 million last quarter, will beat the fast-ticking financial clock. According to First Call/Thompson Financial, which tracks analysts recommendations on stocks, 10 of the 11 analysts who follow Xerox have "hold" ratings on it — generally, the worst rating a sell-side analyst will give. Xerox shares, which have plunged precipitously in the last few months, closed at \$4.69 yesterday, down 31 cents.

"Most people expected the Moody's downgrade, but the finality of it in the context of a difficult overall credit market caused the stock to decline," said Jack L. Kelly, an analyst with Goldman, Sachs.

Some analysts suggest that arbitragers are selling Xerox equity short and buying bonds, with the idea that if the company goes bankrupt, the short positions will pay off, while bondholders will at least recover something. Several suggested that the stock's depressed price is also leading to year-end tax-loss selling.

Abandoned by investors, Xerox is desperately trying to sell assets. It wants to sell two-thirds of its famed research center, and to get out of the equipment-financing business. The company is expected to sell its China operations to the Fuji Photo Film Company within the next few weeks. Fuji also is said to be interested in buying half of Xerox's 50 percent stake in FujiXerox, their joint venture company in Tokyo. That would leave Xerox with just 25 percent of FujiXerox.

Xerox had expected to announce that sale by now, but some analysts suggest that negotiations may be snagged as Fuji tries to wring concessions from Xerox regarding FujiXerox's right to sell its own products in the United States. Until now, the joint venture had agreed not to compete on Xerox's home turf.

At less than \$5 a share, Xerox is vulnerable to buyout firms, who might acquire the company and sell its assets. But analysts say Xerox's huge debt is an effective poison pill.

Many investors have lost patience with Paul A. Allaire, the former chairman that Xerox brought back to lead its turnaround. Several have clamored for an outsider to come in.

Checks with executive recruiters suggest that no active search is going on. While most executives would shy away from a company with such financial problems, recruiters say that some might relish it.

Dayton Ogden, co-chairman of the search firm Spencer Stuart, put it bluntly: "There are turnaround artists out there with big egos who would love to be associated with such a great brand name."

Young Don't See Cool in Levi's Name

WASHINGTON (Reuters) - Young shoppers no longer think Levi Strauss & Co. clothes are cool, helping to sap sales and profits, said the maker of Levi's jeans and Dockers pants.

The San Francisco-based company, whose business has been declining for the past three years, pointed to "a substantial deterioration in the perception of the Levi's brand by younger consumers," according to a Securities and Exchange Commission filing on Thursday.

It saw operating income fall 75 percent to \$102.3 million in 1999 from \$411.5 million in 1997, while net sales dropped 25 percent to \$5.1 billion in 1999 from \$6.9 billion in 1997.

The company also cited other factors for its declining financial performance, including intense competition from designer and private label clothes, poor presentation in stores and supply chain problems.

The erosion of its brand came despite a 1999 company-paid study by an international market research firm that said the Levi's brand was the most recognized casual clothing brand in all 17 markets studied in the United States, Canada, Germany, Italy, France, the United Kingdom, Japan and Australia.

And nearly 71 percent of U.S. male consumers aged 18-45 own Dockers casual pants, industry research showed. Basic jeans are the company's biggest generator of sales and gross profits.

Levi Strauss has undertaken a restructuring, including a shift to manufacturing one-third of U.S. jeans internally in 1999 from two-thirds in 1997, and hiring a new senior management team.

Levi Strauss has also reduced its work force by 18,500 since 1997 and closed 29 of its owned-and-operated production and finishing facilities in North America and Europe.

It warned in the SEC filing about substantial debt and interest payments that could hurt future operations.

At February 2000, total debt was \$2.4 billion, and it had \$365.5 million in additional borrowing capacity under bank credit facilities.

The credit facilities mature in January 2002, when Levi Strauss will be required to refinance borrowings.

"We cannot assure you that we will be able to obtain replacement financing at that time or that any available replacement financing will be on terms acceptable to us," it said in the SEC filing.

The company warned that it could have to sell assets or surrender them to lenders to avoid defaulting.

The company is privately held by descendants of the family of founder Levi Strauss, a Bavarian immigrant.

Tough Jeans, a Soft Heart and Frayed Earnings at Levi Strauss

June 25, 2000

By KARL SCHOENBERGER

SAN FRANCISCO -- Robert D. Haas, the beleaguered chairman of Levi Strauss & Co., has a dilemma on his hands that few people

outside the company fully appreciate: endangered family values.

Haas is the scion of a proud San Francisco clan that has for five generations owned and managed the blue jeans maker with an unconventional devotion to principles as well as profits. But now, with sales falling and profits scarce, a new pragmatism has taken hold.

A new chief executive has been recruited from outside the family. In the last three years half the headquarters staff has been replaced or left. A plan to pay hundreds of millions of dollars in bonuses to employees has been canceled.

Even so, financial results disclosed last week suggest that the company has only slowed its decline. Sales continued to deteriorate in 1999, and the company -- after a huge restructuring charge -- was barely profitable.

Back in 1996, Haas made a risky decision to address family disputes and succession problems through a leveraged buyout that consolidated ownership within a group of relatives who shared his values.

To pull it off Levi took on \$3.3 billion in debt. While dissident family members and senior employees who sold their stock were handsomely rewarded, the timing could not have been worse for the company.

Soon after, Levi Strauss, the world's largest manufacturer of branded apparel, saw its sales go into a free fall. The company whose founder invented blue jeans in the 1850s, woke up to find its market deteriorating. Haas, admitting that his company had fallen prey to complacency and sloppy management, says it hardly noticed that its iconic blue jeans were losing their appeal to the young.

"There's nothing as blinding as success," Haas said in a two-hour interview last week. "It's easy to get inbred and forget that businesses go through cycles. We took our eye off the ball. I plead guilty as the CEO in charge."

The Haas family's paternalistic management was the first principle to be compromised. Long after his competitors had rushed to use cheaper contract labor in developing countries, Haas resisted the dry efficiencies of globalization. Now, after 29 plant closures and the layoffs of some 18,500 people -- nearly half the work force -- the company has moved the bulk of its jeans production into contractors' hands overseas.

Meanwhile, the debt, though reduced to \$2.3 billion, continues to pressure the company -- interest costs actually rose last year -- and crimp its ability to retool.

Prices for Levi's bonds, some of them now publicly traded even though all the company's stock is privately held, sank to as low as 50 cents on the dollar last year. They rose to the still-dismal level of about 80 cents only after the company decided to more fully open its books to investors in April, including making quarterly announcements of its results.

Levi Strauss is also still reeling from a chaotic management shakeup that came to a head in January 1999, when the company's president, Peter Jacobi -- a Levi veteran who had been in charge of operations only a year -- retired under a cloud with no replacement in sight. Things did not begin to settle down until September, when the leading candidate to replace Jacobi demanded Haas' title of chief executive -- and got it.

Haas bashfully stepped aside and brought in the candidate, Philip A. Marineau, a corporate turn-around specialist and marketing

strategist who ran Pepsi's North America division. Marineau, 53, had distinguished himself by turning the sports drink Gatorade into a mass consumer brand while an executive at Quaker Oats. During his 18-month stint at Pepsi he succeeded in besting archrival Coke's domestic market share for the first time in a decade.

"This enterprise is too big and there's too much at stake to leave it to genes alone," said Haas. "What we need is professional and competent leadership."

Under the new leadership of a cola war veteran, Levi Strauss is fighting for survival on several fronts. First, it must overcome deep skepticism among bond investors and make a convincing case that drastic triage has put it on the track toward recovery.

More specifically, it has the urgent task of fixing persistent delays in its distribution to stores, which have worsened the sales decline. The big test comes in late summer, when Levi needs to get orders on retailers' shelves in time for the new school year -- a test the company has failed miserably in recent years.

Equally important is its need to revitalize its most important asset, its legendary name. Without the aura of the Levi's brand -- which long stood for authenticity, hipness, quality, personal freedom and even political consciousness -- the company might have been just another purveyor of denim pants.

The brand also benefits from the company's social values. Levi's history is rich with anecdotes illustrating the Haas family's belief that there is more at stake in business than profits, and that this ethical orientation is ultimately good for business.

The company kept idle workers on the payroll during the Great Depression, then became a

pioneer in integrating factories in the South in the 1950s. Amid the rising furor over contractors' exploitation of foreign workers in sweatshops, Levi set a standard in 1992 with a global code of conduct for protecting worker rights. Some monitoring groups, however, have criticized Levi for not living up to its code. Levi has responded by allowing outsiders to have a closer look at its contractors. Doing the right thing, Levi's leaders reasoned, guards the brand from scandal.

As the latest example, Haas cites the generous severance and retraining benefits offered to employees of the factories Levi closed over the past three years. Those gestures earned the company grudging praise from its unions. With the exception of angry protests in Europe, where five factories were closed, workers greeted their termination with quiet resignation. Severance and restructuring costs totaled \$1.5 billion.

"I don't want my tombstone to read: 'He shipped a billion pairs of jeans,'" said Haas, 58, who kept the flame of a small denim-colored candle conspicuously burning on his office table during his interview. "I can sleep better at night knowing that the package we put together for our displaced people provided them with far more benefits than what is conventional."

If laying off American workers might seem at odds with the family's values, Haas has proven himself willing to trim excess capacity. Shortly after he became chief executive in 1984, he closed 27 plants and dismissed 10,600 workers. "You have to have a financially viable business, or all the words about values can ring hollow," he said.

But if Haas remains the company philosopher, Marineau has championed the cause of

pragmatism. He says he shares Haas' principles, but wants the company to operate more like a conventional business. "Levi's is unique in how strongly it states its values and aspirations," he said. "My goal is not to reinvent the values, but to make them relevant to the market and the experience we are in."

Employees credit Marineau with improving company discipline. He started out by cleaning house.

He inherited personnel problems that were perhaps symptomatic of the organization's decay. There was suspected embezzlement: in one publicly disclosed case, an administrative assistant in the customer relations department was arrested after being accused of stealing \$224,000 by double-billing expenses and making personal charges on a corporate credit card. There were recurrent complaints of sexual harassment, including a lawsuit involving an executive in the Dockers division.

In Marineau's drive to improve company performance, about half of the 1,800 employees at the Levi's Plaza corporate headquarters in San Francisco have been replaced with new recruits over the past year, said Dan Chew, vice president for communications.

While Haas is measured and self-critical, Marineau is an exuberant pitchman who argues that the second-quarter earnings report is a positive one, showing as it does that annual sales declines have slowed from double to single digits. He adds that stability is just around the corner.

Still, those latest results suggest that sales will end up well below \$5 billion this year, a steep decline from the \$7.1 billion peak in 1996. Last year, Levi's sales stood at \$5.1

billion and its net profit -- after a huge \$500 million write-off as that year's share of the restructuring costs -- had plummeted to \$5 million.

The financial disclosures, at a company that has long resisted public scrutiny, came in April, in filings to register \$800 million in company debt with the Securities and Exchange Commission and to allow wider ownership and trading. But the disclosures also represented Marineau's new policy of openness. Abandoning the company's traditional insularity will help instill greater discipline -- and enhance the value of the brand, he says, emphasizing, "We're sitting here trying to be as transparent as possible."

If Levi's new exposure helps raise investor confidence, it also reveals just how far the company has fallen. In the 1996 leveraged buyout, which ended the employee stock plan, the company promised its workers bonuses of a full year's salary in 2002 if certain financial goals were met. By last year, the company was so far from reaching these goals that the bonus plan was canceled.

The company also warns in its filings that its debt has retarded its ability to compete with other companies that are less leveraged. "Debt does sharpen your focus," Haas acknowledges. "But we feel that we have the financial breathing room to accomplish what we need to do."

Marineau has no plans to build stores around the nation like those run by its rival, Gap Inc. Levi has only a few stores, continuing to sell mostly through other retailers. It began selling jeans on its Web site in November 1998, but stopped this January after running into logistical problems and disappointing sales. Nor does Levi plan to grow through acquisitions, as has its other major

competitor, V.F. Corp., has done. Levi's share of the \$12.2 billion domestic jeans market has dropped to about 14 percent, down from 31 percent in 1990. Levi says it expects to have enough cash to promote renewed growth. But instead of building factories or stores, Levi plans to shore up its brands. With new products on the way this fall, it is increasing its advertising budget, shifting from cryptic mood advertising targeted at younger audiences to more ads that focus on the products.

The company has credited steady growth in sales of Dockers, its casual clothing brand, with offsetting erosion in blue jeans sales. But the growth of the Dockers line has leveled off, and Marineau envisions only a small expansion in its 22 percent share of the company's revenues, at least in the near future. The company plans to extend its successful Slaters brand of men's dress trousers to pants, jackets, shirts and accessories like belts for both men and women this fall.

More important is the denim division, where Marineau plans to place greater emphasis on setting fashion trends, especially in women's clothing.

To win back American youth, Marineau is counting on what the company calls "Engineered Jeans" coming this fall, which he says have already been a hit in Europe and Japan. Company executives boast that the jeans' slanted back pockets and skewed seams have ergonomic advantages and enough fashion appeal to bestow a halo on the entire denim division. That division still accounts for 76 percent of Levi's sales.

If debt analysts are gaining confidence in the company's financial stability, apparel analysts are still unsure about Levi's fashion sense and

its new leader. Harry Bernard, an apparel industry analyst at Colton Bernard in San Francisco, thinks Levi Strauss should stop trying to be a fashion innovator and hone its core business of selling competitively priced jeans. "I believe they'll be around for a long time to come as a major player," Bernard said. "But they'll never again be a leader in fashion trends for young consumers."

He expressed doubts about Marineau's grasp of the complexities of the jeans business. "He was tremendously successful in taking Pepsi ahead of Coke, but all he was marketing was brown water in a can," he said. "He simply has to have the time available to transfer his skill sets to the crazy fashion industry. It's totally emotionally different."

Haas, however, remains confident that he has found in Marineau a capable chief who also subscribes to the business principles that distinguish Levi Strauss from its competitors.

Since the company no longer has many of its own workers left to benefit from its paternalism, the true test of its sincerity in putting values on a par with profits comes in the overseas factories where most of its products are now made. After a decade of nimbly skirting controversy, Levi withdrew production earlier this year from the Pacific island of Saipan, where allegations of labor violations are persistent.

Company executives say they must remain vigilant. On May 15 an e-mail to employees from Haas, Marineau and Karen Duvall, a vice president in charge of Levi's supply chain, warns overseas executives that, even while the company is floundering, they must not try to cut costs by skirting the code of conduct.

"We have always said that the true test of management's commitment to our values is how

we will behave when times are tough," the message said. "Make no mistake: despite current challenging business conditions, our guidelines are not negotiable."

But if Levi's code of conduct has inspired the adoption of similar policies by many other companies, it still isn't easy being the first to put company values on the line.

"When you set your standards high, it becomes a huge risk, because if you can't live up to them you risk being called a hypocrite," Haas said. "I'd rather have that than have the risk of being part of just another conventional company."

Hewlett-Packard and EMusic.com to Offer Bonus MP3 Music Downloads To CD-Writer Customers

Date: Friday, June 30, 2000 7:31:23 AM

REDWOOD CITY, Calif., June 30

/PRNewswire/ -- EMusic.com Inc. (Nasdaq: EMUS), the Internet's leading seller of downloadable music, today announced an innovative alliance with Hewlett-Packard Company (NYSE: HWP), the worldwide leader in CD-rewritable (CD-RW) drives. Under the agreement, HP will purchase a minimum of approximately \$3 million of downloadable music and services from EMusic to be bundled with future HP CD-Writer products. The agreement covers the next three calendar quarters, between July 1, 2000 and March 31, 2001.

A FAST- CHANGING GENIE ALTERS THE WORLD

December 11, 2000

By JOHN MARKOFF

At the outset, it was a free and simple map to the buried treasures of the information age.

Then it morphed into something else, fueling an astounding "new economy" gold rush that at its peak last year contributed several trillion dollars in new wealth to the nation's stock markets. (Lately, things have not panned out as well for the prospectors.)

In a remarkably short period, the World Wide Web has touched or has promised to alter — some would say threaten — virtually every aspect of modern life. The Web has caused giant corporations to adjust their business strategies, whether General Electric, General Motors or General Mills. And such are the abilities of the Web to "scale" — whether up or down — that it is also restoring craft and commerce in remote Cambodian villages. (Click on www.villageleap.com to view the current selection of woven scarves from the village of Robib in north central Cambodia. Major credit cards cheerfully accepted.)

The Web has been hailed as the most significant computing advance of the 20th century, and yet to see the Web as a single, static invention is to miss the point. Today's Web is not yesterday's, or tomorrow's.

Initially, the Web simply exploited the most powerful attribute of what was then a collection of computer networks called the Internet. That attribute, simply put, was the ability to share information globally and, when everything was working, instantaneously.

Recall that during this same period, in the early 1990's, companies like America Online and Prodigy were trying to keep computer users corralled within proprietary online services. Such services, which by that point had attracted only a few million users combined, were designed to make customers captive audiences of whatever "content" the network operators chose to provide. (It says as much about the adaptability of America Online's executives, as it does about evolving technology, that AOL has been able to turn itself into one of Web's most popular brand names.)

Compared with the old proprietary approach, the Web had a truly worldwide reach — even if going overseas meant little more, at first, than checking the Webcam that was trained on a coffee pot in a Cambridge University computer lab.

The Web's strengths were precisely what many experts had long viewed as the Internet's weakness: the so-called "any to any" quality that treated all computers on the network as equals. Unlike the telephone network, in the words of David Eisenberg, the former Bell Labs researcher, the Internet was the ultimate "stupid" network, because all the intelligence and the power resided at the end points, not in the middle.

As with the Internet itself, the Web's roots lay in the late 1960's. Back then, Douglas Engelbart, a young engineer leading a small team of researchers at Stanford Research Institute, and Ted Nelson, a social scientist working solo, had independently come up with an idea that came to be called hypertext. With hypertext, information that allows the cross-referencing of digital documents is encoded right into the documents.

But it was not until 1990 that Tim Berners-Lee, a British programmer at the CERN physics research center in Geneva, developed hypertext markup language — or HTML, the embedded referencing system that is encoded into each Web document. It was HTML, followed a few years later by easy-to-use Web browser software like Mosaic (and Mosaic's commercial offshoot, Netscape Navigator), that made today's Web feasible.

But feasibility also came in a confluence of related technologies that made computers usable by nontechnical people: mice pointing devices; graphical, or image-based, interfaces; widespread commercial access to the Internet; and perhaps most important, affordable personal computers with sufficient power to search for and display graphical information.

The Web turned the formerly text-based Internet into a multimedia system. And as technology continues to evolve, the Web is incorporating elements of all other media — print publishing, telephones, music and even television and movies. (Of course, as anyone who has conducted an Internet phone conversation or downloaded a Web video can attest, the medium is not yet always as good as the message.)

Where does the Web go next?

As it moves beyond the PC onto hand-held devices, tablet computers and other so-called digital appliances, while spinning out a gossamer matrix of fiber optic cables and wireless antennas, the Web seems intent on living up to its World Wide name. Today, about half the nation's population has access to the Web via PC's. Within a few years, the Web could be accessible by half the global population, although in many cases the access will be through digital cell phones and other wireless devices.

Another watershed technology is also starting to redefine the Webscape. Until now, the Web has largely involved humans retrieving information from machines. But now comes a protocol known as XML, for Extensible Markup Language. XML organizes data so that computers can communicate directly without human intervention.

Within the next three years, XML is expected to be at the heart of the next-generation Web. And the cultural implications may be even more profound than with the first generation.

One possibility is the creation of vast automated global markets in which suppliers and manufacturers can let their computers find, buy and sell goods and services robotically. Or genetic researchers looking for gene therapies could turn their computers loose to sift through one another's databases to identify and propose medically promising possibilities.

What are the consequences, if many routines of modern life can be conducted without human intervention?

Though the Web was initially hailed as a global digital library of Alexandria, it soon became apparent that the free flow of digital information had a darker side. The last seven years of the Web have brought new social challenges, including new threats to privacy and intellectual property law. Whether music, child pornography or hate speech, the flow of information across geographic, legal and cultural boundaries is now virtually unstoppable.

What will happen in technology's next generation, when Web machines routinely speak directly to other machines? A grand utopian transformation? Or is the world about to embark on the dark course described in Arthur

C. Clarke's 1965 short story, "Dial F for Frankenstein"? The story details the first moments of a globally connected computer network, in which the network becomes a sentient being — though one that behaves like a 2-year-old child.

In reality, the impact of the Web's next generation will probably resemble the current one, with changes taking root on the broad middle ground between human perfection and willful machine tantrums. The only certainty may be this: The world will not have time to comfortably contemplate the consequences, for the next chapter in Web's history is already hurtling forward, in Internet time.

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THE SOUL OF THE ULTIMATE MACHINE

December 10, 2000

By JOHN MARKOFF

A JOLLA, Calif. -- The Silicon Valley crowd that assembled last week in a San Francisco airport hotel had come to hear about mobile electronic commerce, a most immediate concern for people who spend many of their waking hours thinking about whether their latest e-business solution will merit venture capital dollars.

They learned about something very different.

Instead of talking about buying Barbies online, the astrophysicist Larry Smarr came to tell them about what he calls "the emerging planetary supercomputer." The Internet, he explained, is evolving into a single vast computer fashioned out of billions of interconnected processors. Then he went another step: "The real question, from a

software point of view, is: Will it become self-aware?"

To Dr. Smarr, the idea of a thinking machine that might emerge spontaneously from billions of interconnected large and small computers isn't harebrained at all. He said he was simply extrapolating a series of significant trends that, to him, are remarkably obvious. And when it comes to extrapolating trends and forecasting technological revolutions, Dr. Smarr is worth listening to.

Fifteen years ago — prehistory in Internet terms — Dr. Smarr persuaded the federal government to establish supercomputer centers for civilian research. That bit of brass led to the birth of technologies like the Web browser and advanced computer-graphics programs that allow scientists to see how hurricanes work and let moviegoers stare dinosaurs in the eye. Along the way, he also helped expand a network of computers that were owned by military contractors, corporations and universities into what is now called the Internet.

Now Dr. Smarr has persuaded Gov. Gray Davis of California to put him in charge of the California Institute of Telecommunications and Information Technology, a new state-financed research academy in this seaside San Diego suburb, with the goal of envisioning the future — and making it happen. Governor Davis announced his decision to authorize Dr. Smarr's institute and two others on Thursday.

And what Dr. Smarr sees is this: the rapid emergence of a much more extensive cyberspace that will essentially mirror the physical world. He imagines bridges that are covered with a fabric of computerized sensors that will automatically tell engineers where earthquake damage has occurred. Or a world in

which intelligent buildings whisper directions to visitors on the way to their destinations.

"The emerging information grid is going to be far more pervasive than the electric power grid is today," he said.

Still, the idea that the Internet may transform itself into a global computational grid with a mind of its own has generally been considered far-out stuff from the pages of science fiction novels.

The idea of a thinking machine may sound outrageous, but Dr. Smarr's record has made him one of the world's most respected computer technologists. He created the research center that contributed to the development of the Internet and then invented the graphical browser — marketed as the Netscape Navigator and Internet Explorer — that opened the Net to the masses.

As director of the computer research institute announced on Thursday, he is now in the position to test even his most far-out ideas. The institute will be established with more than \$300 million in state and private funds over four years.

Based jointly at the University of California campuses at San Diego and Irvine, it will focus on engineering new types of sensors, creating an advanced digital wireless Internet and designing a new class of distributed-computing machines, which break a problem into separate pieces to speed calculations. It will also work on applying those technologies to problems in the environment and transportation, as well as to genomic medicine and new-media arts.

Several times in the past, Dr. Smarr had equally radical ideas about where computing was headed, and each time he correctly spotted the Next Big Thing.

He founded the National Center for Supercomputer Applications at the University of Illinois at Urbana-Champaign in 1985, and helped to develop a network that linked it to the nation's other four supercomputer centers.

His center also did pioneering work in scientific visualization, and one of its brightest scientists, Stefen Fangmeier, went on to become a leading graphics animator in Hollywood. There, he helped to create special effects for movies like "Jurassic Park" and "The Perfect Storm."

Yet those advances pale beside the fact that seven years ago, a small group of student and faculty researchers working at Dr. Smarr's center created the first graphical Web browser, Mosaic, igniting the World Wide Web and the electronic-commerce explosion.

The center's advances flowed directly from Dr. Smarr's passion over the last three decades: to use powerful computers to improve the quality of science. His goal in developing the supercomputer centers was to give tools to scientists that had once been available only to bomb designers and code breakers.

The Internet and the World Wide Web grew in part from his drive to build better computer tools to permit scientists to collaborate and share information.

"He fostered the kind of environment that I had always associated with Xerox Palo Alto Research Center or Bell Labs," said Marc Andreessen, the Netscape cofounder, referring to two widely admired information technology laboratories. "People were free to follow their instincts. He tends to attract really, really smart people and gives them the latitude to pursue their ideas."

But Mr. Andreessen added that while he was there, the University of Illinois shared at least one weakness with the Xerox lab in Silicon Valley: It had a hard time bringing innovations to the marketplace. Mr.

Andreessen was able to start Netscape by licensing the institute's Mosaic technology, but only after overcoming the university's resistance, he said.

"What they never got at N.C.S.A., what they never had, was a culture of entrepreneurial spinoffs," said Mr. Andreessen, adding that the culture had since changed. "If he can add that at the new institute, a culture that permits people to go off and start companies, then I think he will really have something."

Over one and a half decades at the Illinois supercomputer center, Dr. Smarr built a reputation as a scientist who helped to develop the use of computers by both elite scientists and millions of nontechnical Web surfers.

"Larry has had a huge impact," said Robert R. Borchers, director of the division of advanced scientific computing at the National Science Foundation. "He's a legitimate scientist, and he's usually one step or two ahead of the trend on technology."

Dr. Smarr's new institute will draw together more than 200 faculty members at the San Diego and Irvine campuses to re-invent the Internet using technologies like optical fiber cables, digital wireless networks and micro-electro-mechanical systems, or MEMS.

Since the end of the cold war, this part of Southern California has changed from a stronghold of the military and aerospace industries into a center for wireless, optical, semiconductor and biotechnology companies.

Dr. Smarr settled on this area — 400 miles south of Silicon Valley — because it was both a center for high technology and a fertile ground for what he calls "I.P.O. capitalism."

"Based on the electronic-commerce boom that followed the development of the Mosaic Web browser, I realized that a new model of growth was emerging," he said. "I knew I had to get to a place where there was an explosive private sector."

Among the companies that have already committed themselves to investing \$140 million in Dr. Smarr's new institute, dubbed Cal-(IT)2, are I.B.M., Sun Microsystems, Qualcomm, Boeing, Broadcom, Ericsson, Microsoft, Intersil, ST Microelectronics and Sony.

Dr. Smarr's plan is to use the institute to attack a few very difficult problems with what he calls "mega-computers" — thousands or even millions of separate computers lashed together with optical fibers via the Internet.

The most dramatic challenge for the institute, considering its location in automobile-choked Southern California, is to build a prototype for an "intelligent transportation infrastructure." It would use the Internet to wirelessly link sensor arrays under freeways with computers in cars. Dr. Smarr believes that it will be possible to build a giant computing grid that can control traffic more effectively.

"When your computer knows where each car is planning to go, it is a problem you can solve," he said.

The challenge is that a computer that large has never been built, much less programmed. Such a machine would have what Dr. Smarr calls an "effervescent" architecture. It would comprise millions of parts — processors,

communications links and storage units — that come and go unpredictably.

"Larry's plan is to take the Web into the physical world," said Ramesh Rao, a professor of electrical engineering at the University of California at San Diego.

Many people in the computer industry believe that if such a machine is to be built, Dr. Smarr is the ideal person to lead the quest.

"He has long years of experience in the hardest part of this whole business," said Richard Shaffer, president of Technological Partners, a computer industry consulting firm. "That's getting software to work together across lots and lots of processors."

Dr. Smarr's obsessive search for more computing speed derived from his theoretical work as a student in the 1970's. Then, as a first-year graduate student at Stanford, he was trying to apply Einstein's general theory of relativity to the collision of two black holes.

At the time, the only way to get access to enough computer power to start the experiments needed to test his theories was to turn to the nation's nuclear weapons laboratories.

Dr. Smarr had gone to Stanford to study with Leonard Schiff, one of the world's leading experts in relativity theory. But Dr. Schiff died unexpectedly during Dr. Smarr's first year in graduate school. After moving to the University of Texas at Austin, Dr. Smarr linked up with another group of relativity experts. He eventually received a Ph.D.

At Texas, his adviser told him bluntly to get top-secret nuclear weapons clearance so he could go to the Lawrence Livermore National

Laboratory in California and "learn from the great ones."

For Dr. Smarr, contact with the weapons labs was what he now describes as a Promethean experience. Early on, he found that a problem that would take eight hours to run on a Digital Equipment VAX computer at the University of Texas would require just two minutes on one of the weapons laboratories' supercomputers.

Several years later, as a post-doctoral researcher at Harvard, he was a regular visitor at weapons labs, flying in for a few days at a time and cadging time on supercomputers to run simulations of thermonuclear forces far more awesome than the hydrogen-bomb makers had imagined.

"It was what I called 'interstitial' living," he said. "I would show up on Friday afternoons and ask, 'Hey, are you guys going to be running your bomb codes this weekend?'"

The experience transformed him. The lab visits were like ventures into an advanced civilization with powerful tools beyond the grasp of mere mortals.

"I remember going back to Harvard and feeling like being an alien landing on a primitive planet," he said.

In 1983, as a junior faculty member at the University of Illinois at Urbana-Champaign, Dr. Smarr did something unprecedented. He sent an unsolicited, \$50 million proposal to the director of the National Science Foundation, George Keyworth. In it, he called for the creation of a supercomputer center at the university to give civilian scientists the same access to powerful computers that was enjoyed at the nation's weapons labs.

At about the same time, Sid Karin, a scientist at General Atomics, a contractor at the

University of California at San Diego, sent a similar proposal to the government. Two years later, the National Science Foundation acted, setting up a nationwide network of five centers dedicated to broadening scientific access to supercomputers.

Dr. Smarr still frets over how little the nation supports both the direct and indirect benefits of the centers. "What our society doesn't understand is how critical investment in basic science and technology is to advances in society," he said.

California is counting on such a spinoff effect from its three new research institutes.

Dr. Smarr draws parallels to the nation's land-grant universities of more than 100 years ago. "This is really just back to the future," he said. "Why did the citizens of the Midwest allow their tax dollars to be spent on agricultural research? Because it led directly to more economic productivity."

And what America's agrarian economy of the 19th century found in basic scientific research, Dr. Smarr sees in the proliferation of networked microprocessors in the next decade. Not only is the power of individual computer processors growing at an exponential rate, but the number of interconnected computers and computing devices is exploding.

On Monday, at the San Francisco conference, Dr. Smarr described a networked world in which the number of personal computers would soon double, to one billion. Moreover, there will soon be three billion Internet-connected cell phones — and, more important, as many as 16 billion Internet-connected computers embedded in everything from automobiles to toasters.

It is a world, he said, in which a world of Net-connected computers and electronic sensors

"overlay" the real world in such a way that computer power enhances every human action. For example, he sees a time when supercomputers let scientists see hurricane damage as it occurs, as spy satellites work for the military today.

"We're talking about something very radical," he said. "This is the world we're coming to. It's an enchanted world where everything has processors in it linked by the Internet."

He defends his vision of the future of cyberspace with the certainty of a physicist. Computer processing power is advancing so rapidly, he said, that society is likely to soon go through a revolution as dramatic as the "phase change" when water changes into ice.

For that reason, Dr. Smarr said he plans to hold regular conferences at Cal-(IT)2 about the consequences of scientific and technological change.

Dr. Smarr is not the only computer researcher grappling with the social consequences of wildly accelerating computer power. William Joy, co-founder of Sun Microsystems, recently wrote an article in Wired magazine warning about the potential perils of intelligent machines. Two well-known computer researchers, Hans Moravec and Raymond Kurzweil, have also written books this year about the likelihood of the emergence of intelligent machines.

Mr. Joy's article has touched off a debate among computer scientists about the consequences of their work. Dr. Smarr said he believes that computer scientists may need to grapple with the challenges, perhaps meeting in the same way as biologists did in 1975 at the Asilomar Conference to face the ethical challenges of biotechnology.

In Dr. Smarr's Brave New Cyberspace, the answer shouldn't be long in coming.

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CLOTHES GET SMARTER THAN THE WEARER

By Katie Nguyen

BRUSSELS (Reuters) - Clothes that tell you you've forgotten your keys or warn you when your wallet is stolen.

A jogging suit that puts you through your paces.

It's not the stuff of science fiction, but a five-year project by the Brussels-based research group Starlab to come up with a form of ``intelligent clothing.'

``(The tracksuit) monitors you starting to run. It configures data on your heartbeat. It plays a certain type of music and adapts the rhythm of the music to push you harder or slow you down,' said Walter Van De Velde, head of the scientific think-tank whose embryonic designs could revolutionize clothing.

``The mobile phone function in the clothing sends the data by e-mail to your sports club, which receives the report on your training by the time you've taken your shower.'

For the uninitiated, Van De Velde's outline evokes the workout from Hell: a relentless personal trainer and no way of cheating the results.

But intelligent clothing need not just be practical, it could also indulge nostalgic yearnings, Van De Welde says.

``I like the idea of clothing as memory, which accumulates part of the impression of the place you are staying, say, on holiday. It would record the freshness of the air, the

background noise, it would take snapshots like a tourist.'

He even suggests ``sound perfume'' -- heat sensors which would pick up the wearer's mood, detecting panic or embarrassment, and play music via small speakers to match it.

``The sound of the wind blowing could represent turbulence,' Van De Velde suggested. ``As you relax it becomes gentler.'

Artificial Intelligence

Founded by Van De Velde two years ago, Starlab has so far received funding from the U.S. space agency NASA, national governments and the European Commission.

Known as the project's godfather, Van De Velde left Brussels University (VUB) where he was co-director of the artificial intelligence unit, to help establish the new firm.

Almost one year into its research, Starlab's i-Wear showed off its first prototype at its elegant headquarters -- an ornate former embassy where some 60 scientists from 28 countries work on projects ranging from artificial brains to time travel to intelligent clothing.

At this initial stage, the prototype resembles a shirt composed of several layers with heat sensors and microphones tucked away in the cuffs and collar to measure light and sound.

The researchers explain that by putting a computer chip in your car keys, which is then picked up and read by another in your shirt, the garment could easily recognize if this item was missing and alert the wearer.

``We looked at everyday objects -- batteries, mobile phones, laptops -- and decided to

integrate their function -- sound, power, communications -- into clothing," Van De Velde said.

TRULY MARKETABLE?

In its first phase the i-Wear prototype still looks weighed down with gadgets but the researchers are aiming for a seamless appearance and more sophisticated mechanism.

``In the long term, we are looking to integrate computing capabilities into the fabric and fibers themselves," Van de Velde said. ``The way the threads are woven would create different circuits.''

He said scientists had already considered ways to ``charge'' these fibers such as using washing powder to deposit a conductant which would start generating power once it was exposed to light, or coating fibers with the same substance.

But would intelligent clothing sell?

Already, 10 international brands have sponsored Starlab's i-Wear project and reaped the fruits of the research.

Among these are well-known names such as sportswear's Adidas, clothing manufacturer Levi Strauss and luggage maker Samsonite.

``I believe there would be a market for young people, who would be interested in it, less as a useful thing, but as a gadget," Van de Velde admitted.

``It remains to be seen if it's useful for everybody.''