

Steve Paul Jobs

Born 1955 Los Altos CA; Evangelic bad boy who, with Steve Wozniak, co-founded Apple Computer Corporation and became a multimillionaire before the age of 30. Subsequently started the NeXT Corporation to provide an educational system at a reasonable price, but found that software was a better seller than hardware.

Educ: Ungraduated, Physics, literature, and poetry, Reed College, OR; *Prof. Exp:* Atari Corporation; Apple Corporation; NeXT Corporation.

Going to work for Atari after leaving Reed College, Jobs renewed his friendship with Steve Wozniak. The two designed computer games for Atari and a telephone "blue box", getting much of their impetus from the Homebrew Computer Club.

Beginning work in the Job's family garage they managed to make their first "killing" when the Byte Shop in Mountain View bought their first fifty fully assembled computers. On this basis the Apple Corporation was founded, the name based on Job's favorite fruit and the logo (initially used as the unregistered logo of the ACM APL Conference in San Francisco) chosen to play on both the company name and the word byte. Through the early 1980's Jobs controlled the business side of the corporation, successively hiring presidents who would take the organization to a higher level. With the layoffs of 1985 Jobs lost a power struggle with John Sculley, and after a short hiatus reappeared with new funding to create the NeXT corporation.

Quotations

Woz[niak] was the first person I met who knew more about electronics than I did.
About Jobs: Like the Bhagwan, driving around Rancho Rajneesh each day in another Rolls-Royce, Jobs kept his troops fascinated and productive. The joke going around said that Jobs had a 'reality distortion field' surrounding him. He'd say something, and the kids in the Macintosh division would find themselves replying 'Drink poison Kool-Aid? Yeah, that makes sense'. - *Robert X. Cringely, 1992.*

Bibliography

Biographical Caddes, Carolyn. 1986. Portraits of Success: Impressions of Silicon Valley Pioneers, Tioga Publishing Co., Palo Alto CA.

Cringely, Robert X. 1992. *Accidental Empires*, Williams Patrick/Addison Wesley, Reading MA.

Denning, Peter J. and Karen A. Frenkel. April 1989. "A Conversation with Steve Jobs", *Comm. ACM*, Vol. 32, No. 4, pp. 437-443.

Levy, Steven. 1984. *Hackers: Heroes of the Computer Revolution*, Anchor Press/Doubleday, Garden City, NY.

Slater, Robert. 1987. *Portraits in Silicon*, MIT Press, Cambridge MA, Chapter 28.

Young, Jeffrey S. 1988. *Steve Jobs: The Journey is the Reward*, Scott, Foresman and Co., Glenview IL.

Short biography copyright J. A. N. Lee, 1994.

Biography by Lee Angelelli, Undergraduate Student, Department of Computer Science, Virginia Tech, Fall 1994. (Assignment as part of the requirements for the course "Professionalism in Computing", CS 3604), very lightly edited by J.A.N. Lee

Steve Jobs innovative idea of a personal computer led him into revolutionizing the computer hardware and software industry. When Jobs was twenty one, he and a friend, Wozniak, built a personal computer called the Apple. The Apple changed people's idea of a computer from a gigantic and inscrutable mass of vacuum tubes only used by big business and the government to a small box used by ordinary people. No company has done more to democratize the computer and make it user-friendly than Apple Computer Inc. Jobs software development for the Macintosh re-introduced windows interface and mouse technology which set a standard for all applications interface in software.

Two years after building the Apple I, Jobs introduced the Apple II. The Apple II was the best buy in personal computers for home and small business throughout the following five years. When the Macintosh was introduced in 1984, it was marketed towards medium and large businesses. The Macintosh took the first major step in adapting the personal computer to the needs of the corporate work force. Workers lacking computer knowledge accomplished daily office activities through the Macintosh's user-friendly windows interface. [Halliday, 1983, p. 204] Steve Jobs was considered a brilliant young man in Silicon Valley, because he saw the future

demands of the computer industry. He was able to build a personal computer and market the product. "The personal computer was created by the hardware revolution of the 1970's and the next dramatic change will come from a software revolution," said Jobs. [Halliday, 1983, p. 204] His innovative ideas of user-friendly software for the Macintosh changed the design and functionality of software interfaces created for computers. The Macintosh's interface allowed people to interact easier with computers, because they used a mouse to click on objects displayed on the screen to perform some function. The Macintosh got ride of the computer command lines that intemidated people from using computers. After resigning from Apple Inc., Jobs would continue challenging himself to develop computers and software for education and research by starting a new company that would eventually develop the NextStep computer.

Early History.

Steven Paul, was an orphan adopted by Paul and Clara Jobs of Mountain View, California in February 1955. Jobs was not happy at school in Mountain View so the family moved to Los Altos, California, where Steven attended Homestead High School. His electronics teacher at Homestead High, Hohn McCollum, recalled he was "something of a loner" and "always had a different way of looking at things." [Halliday, 1983, p. 205]

After school, Jobs attended lectures at the Hewlett-Packard electronics firm in Palo Alto, California. There he was hired as a summer employee. Another employee at Hewlett-Packard was Stephen Wozniak a recent dropout from the University of California at Berkeley. An engineering whiz with a passion for inventing electronic gadgets, Wozniak at that time was perfecting his "blue box," an illegal pocket-size telephone attachment that would allow the user to make free long-distance calls. Jobs helped Wozniak sell a number of the devices to customers. [Halliday, 1983, p. 205]

In 1972 Jobs graduated from high school and register at Reed College in Portland, Oregon. After dropping out of Reed after one semester, he hung around campus for a year, taking classes in philosophy and immersing himself in the counterculture. [Halliday, 1983, p. 205]

Early in 1974 Jobs took a job as a video game designer at Atari, Inc., a pioneer in electronic arcade recreation. After several months working, he saved enough money to adventure on a trip to India where he traveled in search of spiritual enlightenment in the company of Dan Kottke, a friend from Reed College. In autumn of 1974, Jobs returned to California and began attending meetings of Wozniak's "Homebrew Computer Club." Wozniak, like most of the club's members, was content with the joy of electronics creation. Jobs was not interested in creating electronics and was nowhere near as good an engineer as Woz. He had his eye on marketability of electronic products and persuaded Wozniak to work with him toward building a personal computer. [Halliday, 1983, p. 205]

Wozniak and Jobs designed the Apple I computer in Jobs's bedroom and they built the prototype in the Jobs' garage. Jobs showed the machine to a local electronics equipment retailer, who ordered twenty-five. Jobs received marketing advice from a friend, who was a retired CEO from Intel, and he helped them with marketing strategies for selling their new product. Jobs and Wozniak had great inspiration in starting a computer company that would produce and sell computers. To start this company they sold their most valuable possessions. Jobs sold his Volkswagen micro-bus and Wozniak sold his Hewlett-Packard scientific calculator, which raised \$1,300 to start their new company. With that capital base and credit begged from local electronics suppliers, they set up their first production line. Jobs encouraged Wozniak quit his job at Hewlett-Packard to become the vice president in charge of research and development of the new enterprise. And he did quit his job to become vice president. Jobs came up with the name of their new company Apple in memory of a happy summer he had spent as an orchard worker in Oregon. [Halliday, 1983, p. 205]

Apple Computer

Jobs and Wozniak put together their first computer, called the Apple I. They marketed it in 1976 at a price of \$666. The Apple I was the first single-board computer with built-in video interface, and on-board ROM, which told the machine

how to load other programs from an external source. Jobs was marketing the Apple I at hobbyists like members of the Homebrew Computer Club who could now perform their own operations on their personal computers. Jobs and Wozniak managed to earn \$774,000 from the sales of the Apple I. The following year, Jobs and Wozniak developed the general purpose Apple II. The design of the Apple II did not depart from Apple I's simplistic and compactness design. The Apple II was the Volkswagon of computers. The Apple II had built-in circuitry allowing it to interface directly to a color video monitor. Jobs encouraged independent programmers to invent applications for Apple II. The result was a library of some 16,000 software programs. [Halliday, 1983, p. 206]

For the Apple II computer to compete against IBM, Jobs needed better marketing skills. To increase his marketing edge he brought Regis McKenna and Nolan Bushnell into the company. McKenna was the foremost public relations man in the Silicon Valley. Nolan Bushnell was Jobs's former supervisor at Atari. Bushnell put Jobs in touch with Don Valentine, a venture capitalist, who told Markkula, the former marketing manager at Intel, that Apple was worth looking into. Buying into Apple with an investment variously estimated between \$91,000 and \$250,000, Markkula became chairman of the company in May 1977. The following month Michael Scott, who was director of manufacturing at Semi-Conductor Inc., became president of Apple. Through Markkula, Apple accumulated a line of credit with the Bank of America and \$600,000 in venture capital from the Rockefellers and Arthur Roch. [Halliday, 1983, p. 206]

Quickly setting the standard in personal computers, the Apple II had earnings of \$139,000,000 within three years, a growth of 700 percent. Impressed with that growth, and a trend indicating an additional worth of 35 to 40 percent, the cautious underwriting firm of Hambrecht & Quist in cooperation with Wall Street's prestigious Morgan Stanley, Inc., took Apple public in 1980. The underwriters price of \$22 per share went up to \$29 the first day of trading, bringing the market value of Apple to \$1.2 billion. In 1982 Apple had sales of \$583,000,000 up 74 percent from 1981. Its net earnings were \$1.06 a share, up 55 percent, and as of December 1982, the company's stock was selling for approximately \$30 a share. [Halliday, 1983, p. 206]

Over the past seven years of Apple's creation, Jobs had created a strong productive company with a growth curve like a straight line North with no serious competitors. From 1978 to 1983, its compound growth rate was over 150% a year. Then IBM muscled into the personal computer business. Two years after introducing its PC, IBM passed Apple in dollar sales of the machines. IBM's dominance had made its operating system an industry standard which was not compatible with Apple's products. Jobs knew in order to compete with IBM, he would have to make the Apple compatible with IBM computers and needed to introduce new computers that could be marketed in the business world which IBM controlled. [Morrison, 1984, p. 86] To help him market these new computers Jobs recruited John Sculley from Pepsi Cola for a position as president at Apple. Jobs enticed Scully to Apple with a challenge: "If you stay at Pepsi, five years from now all you'll have accomplished is selling a lot more sugar water to kids. [Gelman and Rogers, 1985, p. 46] If you come to Apple you can change the world." [Conant and Marbach, 1984, p. 56]

Jobs in 1981 introduced the Apple III, which had never fully recovered from its traumatic introduction, because Apple had to recall the first 14,000 units to remedy design flaws, and then had trouble selling the re-engineered version. Another Apple failure was the mouse-controlled Lisa, announced to stockholders in 1983. It should have been a world beater, because Lisa was the first personal computer controlled by a mouse which made it have a user-friendly interface, but had an unfriendly price of \$10,000. The worst thing about Apple's development of computers was they lacked coherence. Each of Apple's three computers used a separate operating system.

Jobs designed the Macintosh to compete with the PC and, in turn, make Apple's new products a success. In an effort to revitalize the company and prevent it from falling victim to corporate bureaucracy, Jobs launched a campaign to bring back the values and entrepreneurial spirit that characterized Apple in its garage shop days. In developing the Macintosh, he tried to re-create an atmosphere in which the computer industry's highly individualistic, talented, and often eccentric software and hardware designers could flourish. The Macintosh had 128K of memory, twice

that of the PC, and the memory could be expandable up to 192K. The Mac's 32-bit microprocessor did more things and outperformed the PC's 16-bit microprocessor. The larger concern of management concerning the Macintosh was not IBM compatibility. This caused an uphill fight for Apple in trying to sell Macintosh to big corporations that were IBM territory. "We have thought about this very hard and it would be easy for us to come out with an IBM look-alike product, and put the Apple logo on it, and sell a lot of Apples. Our earnings per share would go up and our stockholders would be happy, but we think that would be the wrong thing to do," says Jobs. [Morrison, 1984, p. 86] The strengths of Macintosh design were not memory, power, or manipulative ability, but friendliness, flexibility, and adaptability to perform creative work. The Macintosh held the promise that computer technology would evolve beyond the mindless crunching of numbers for legions of corporate bean-counters. As the print campaign claimed, the Macintosh was the computer "for the rest of us." [Scott, 1991, p.71]

The strategy Jobs used to introduce the Macintosh in 1984 was radical. The Macintosh, with all its apparent vulnerability, was a revolutionary act infused with altruism, a technological bomb-throwing. When the machine was introduced to the public on Super Bowl Sunday it was, as Apple Chairman Steve Jobs described it, "kind of like watching the gladiator going into the arena and saying, 'Here it is.'" [Scott, 1991, p.71] The commercial had a young woman athlete being chased by faceless storm-troopers who raced past hundreds of vacant-eyed workers and hurled a sledgehammer into the image of a menacing voice. A transcendent blast. Then a calm, cultivated speaker assured the astonished multitudes that 1984 would not be like 1984. Macintosh had entered the arena. That week, countless newspapers and magazines ran stories with titles like "What were you doing when the '1984' commercial ran?" [Scott, 1991, p.72]

Jobs' invocation of the gladiator image is not incidental here. Throughout the development of the Macintosh, he had fanned the fervor of the design team by characterizing them as brilliant, committed mavericks. He repeatedly clothed both public and private statements about the machine in revolutionary, sometimes violent imagery, first encouraging his compatriots to see themselves as outlaws,

and then target the audience to imagine themselves as revolutionaries. Jobs, like all those who worked on the project, saw the Macintosh as something that would change the world. Jobs described his Macintosh developing team as souls who were "well grounded in the philosophical traditions of the last 100 years and the sociological traditions of the 60's. The Macintosh team pursued their project through grueling hours and against formidable odds. A reporter who interviewed the team wrote: "The machine's development was, in turn, traumatic, joyful, grueling, lunatic, rewarding and ultimately the major event in the lives of almost everyone involved". [Scott, 1991, p.72]

The image Jobs wanted the public to have of the Macintosh was young, wears blue jeans, and lives in an 80's version of the 60's counterculture. Macintosh was impatient, uncomfortable, and contemptuous of everything that was conventional or hierarchical. He/she was both creative and committed, believing strongly that his/her work ultimately matters. Even if we counted beans for a living, we secretly saw ourselves as Romantic poets. [Scott, 1991, p.73] Jobs approach in developing the Macintosh was like the history of telephones. When the telegraph became popular for communication a century ago, some people suggested putting a telegraph machine on everyone's desk, but everyone would have had to learn Morse code. Just a few years later Alexander Graham Bell filed his first patents for the telephone, and that easy-to-use technology became the standard means of communication. "We're at same juncture; people just are not going to be willing to spend the time learning Morse code, or reading a 400-page manual on word processing. The current generation of personal computers just will not any longer. We want to make a product like the first telephone. We want to make mass market appliances. What we are trying to develop is a computer that can do all those things that you might expect, but we also offer a much higher performance which takes the form of a very easy-to-use product." [Morrison, 1984, p. 98]

As the Macintosh took off in sales and became a big hit, John Sculley felt Jobs was hurting the company, and persuaded the board to strip him of power. John Sculley tried to change the discipline of the company by controlling costs, reducing overhead, rationalizing product lines to an organization that some in the industry

called Camp Runamok. [Morrison, 1984, p. 90] Sculley came to the conclusion that "we could run a lot better with Steve out of operations," he says. [Gelman and Rogers, 1985, p. 46] Jobs tended to value technological "elegance" over customer needs which is a costly luxury at a time of slowing sales. And Jobs's intense involvement with the Macintosh project had a demoralizing effect on Apple's other divisions. [Gelman and Rogers, 1985, p. 47]

Jobs was exiled to an office in an auxiliary building that he nicknamed "Siberia." Jobs says he did not get any assignments and gradually found that important company documents no longer landed on his desk. He told every member of the executive staff that he wanted to be helpful in any way he could, and he made sure each had his home phone number. Few ever called back. "It was very clear there was nothing for me to do," he says, "I need a purpose to make me go." [Gelman and Rogers, 1985, p. 47]

He soon came to believe that he would find no purpose within Apple. In July, Sculley had told security analysts in a meeting that Jobs would have no role in the operations of the company "now or in the future." When Jobs heard of the message he said, "You've probably had somebody punch you in the stomach and it knocks the wind out you and you cannot breathe. The harder you try to breathe, the more you cannot breathe. And you know that the only thing you can do is just relax so you can start breathing again." [Gelman and Rogers, 1985, p. 48]

The Next Step

Jobs sold over \$20 million of his Apple stock, spent days bicycling along the beach, feeling sad and lost, toured Paris, and journeyed on to Italy. It was not until late August that he began to catch his breath. [Utal, 1985, p. 119] Then Jobs thought back on his experience at Apple. Though he is not an engineer, he felt his greatest talent had been spearheading development of new products. Jobs also recalled with special pride that he had helped introduce personal computers into education. [Utal, 1985, p. 119] To collect his thoughts one day, he took up pen and paper and began to write down the things that were important to him. Along with the

development of the Macintosh, he listed three educational projects he had launched: Kids Can't Wait, Apple Education Foundation, and the Apple University Consortium. [Utal, 1985, p. 119]

Inspiration came at the beginning of September 1985 when he had lunch with Paul Berg, a Nobel laureate in biochemistry at Stanford University. Paul Berg explained to Jobs the time consuming trial and error experiments carried out to extract DNA. Jobs asked whether Berg had ever thought of speeding up these experiments by simulating them on a computer. Berg said most universities did not have the necessary computers and software. "That's when I started to really think about this stuff and get my wheels turning again," says Jobs. [Utal, 1985, p. 122]

On September 12, 1985 Steve rose in the board meeting and said in a flay, unemotional voice, "I've been thinking a lot and it's time for me to get on with my life. It's obvious that I've got to do something. I'm thirty years old." [Sculley, 1987, p. 201] Offering to resign as chairman, Steve said he intended to leave the company to start a new venture to address the higher education market. The company Jobs envisioned would have sales reaching \$50 million annually in a few years and would not be competitive with Apple, only complementary, and that he would take with him only a handful of personnel. [Utal, 1985, p. 124] John Sculley said, "all of us want you to reconsider your decision to resign from the board. Apple would be interested in buying 10 percent of your new company." Jobs told the board he would think about it and tell them his decision the upcoming Thursday. [Sculley, 1987, p. 204]

That Thursday Jobs went into Sculley's office and handed him a piece of paper with all five employees that would leave with him. The employee's were Rich Page, an Apple Fellow and one of the company's most import engineering designers, Daniel Lewin, the marketing manager for higher education business, Bud Tribble, the manager of software engineering for Macintosh, Susan Barnes, Senior controller for US. sales and marketing, and George Crow, an engineering manager with vast Macintosh experience. Together, they knew Apple's internal schedules, costs, focus of next products, schedule of when Apple would introduce them, how they would be used, and which individuals and universities Apple would work with

to ensure their success. The board authorized Sculley to begin litigation on the basis that Steve allegedly made plans for the new company while serving as Apple's chairman, and that Steve falsely represented his company and intentions to the board.

A Software Company

After leaving Apple, Jobs' new revolutionary ideas were not in hardware but in software of the computer industry. In 1989 Jobs tried to do it all over again with a new company called NextStep. He planned to build the next generation of personal computers that would put Apple to shame. It did not happen. After eight long years of struggle and after running through some \$250 million, NextStep closed down its hardware division in 1993. Jobs realized that he was not going to revolutionize the hardware. He turned his attention to the software side of the computer industry. In 1994, Jobs feels there is a lot of money in developing an object-oriented industry that would fix the problems companies have in developing software. The corporate developers are going to fuel the object revolution because they know they have a giant problem that needs to be solved in software development, and PC makers are doing less to serve the needs of software developers. [Goodell, 1994, p. 73] Jobs said, "Our primary mission is to establish NextStep as a leading operating system in the Nineties." Now, Jobs envisions NextStep will revolutionize the computer industry by its operating system software which incorporates a hot technology. It's called object-oriented programming (OOP), and OOP lets programmers write software in a fraction of the usual time. [Goodell, 1994, p. 77] Jobs feels OOP is the solution to corporations problems of wasting money to develop software because OOP serves as a blue print to develop programs like blue prints for constructing a building. Jobs thinks the OOP paradigm will have a great effect on the production of software like the effect the industrial revolution had on manufactured goods. "In my 20 years in the industry, I have never seen a revolution as profound as this. You can build software literally five to ten times

faster, and that software is more reliable, easier to maintain, and more powerful," says Jobs. [Goodell, 1994, p. 77]

Jobs feels software programs have gotten bigger, more complicated, and much more expensive to produce. Object-oriented programming changes that by allowing gigantic, complex programs to be assembled like Tinker toys.

Programmers will use pre-assembled chunks of code to build 80 percent of their program thus saving an enormous amount of time and money.

The criticism Jobs received from building the NextStep computer was that he failed in trying to build a second computer empire. Jobs's goal was to produce a NextStep computer for \$3,000 that would land on the desk of every college student. In designing the NextStep computer, he ignored the demands of the computer market. Even his own experts were saying: "Keep in touch with the intended customers and avoid the pitfall of an aerobic isolation; do not assume that the customers will pay any price to secure the latest computer technology; ease the way for customers to adopt a new standard by providing software and hardware bridges that help connect older machines to the new ones." According to developers, he disregarded every one of these lessons when he launched NextStep computer. [Peterson, 1994, p. 73]

In mid 1989, after long delays which Jobs was never blamed for, NextStep finally introduced a \$7,000 monochrome system. The system had no floppy disk, virtually no useful software applications, and a slow magneto-optical disk. When the NextStep computer was introduced, the academic world and corporate America rejected it. In the end, only about 50,000 NextStep machines were ever built, and in February 1993 Jobs announced that NextStep would stop producing hardware and focus all its energy on the NextStep operating system. The operating system was promised to run on a wide variety of platforms. [Peterson, 1994, p. 73]

Jobs recruited an Englishman, Peter van Cuylenburg, age forty-four as his number two person in NextStep to help promote the NextStep computer and organize the company's management. The company's management had decimated. In the past few months virtually all of NextStep's vice presidents had quit. Van Cuylenburg said the quitting of vice's presidents was due to his own toughness. He said, "I've

put pressure on the company, and not everyone was willing or able to accept it. NextStep had too many vice presidents when I arrived, so Jobs and I decided to eliminate some." [Deutschman, 1993, p. 100]

Jobs and Cuylenburg planned on releasing NextStep software to run on other companies computers by the fall of 1993. NextStep did release a version of NextStep's operating system for PC's equipped with Intel's 486 microprocessor. Still, the market did not fully accept NextStep's operating system over OS/2 or Microsoft DOS.

NextStep had also talked with Hewlett-Packard, Sun, and others about licensing NextStep to run on their machines. But these companies thought it was a ridiculous idea, because NextStep is trying to acrimoniously compete against them in hardware. Cuylenburg admits that the scenario makes sense only if NextStep's hardware business is small enough that the major players do not see NextStep's computers as a threat. [Deutschman, 1993, p. 100]

Jobs feels NextStep is moving slowly but surely to being a software company that makes great reference hardware. That is NextStep will have a machine that provides a benchmark of quality. The NextStep operating system will be in a three-way race for the object-oriented operating system of the Nineties against Microsoft's Cairo project and Apple's and IBM's joint venture. [Deutschman, 1993, p. 102]

Considering that object-oriented software has become the key to NextStep's future, it is ironic the Jobs committed the company to it almost by accident. When NextStep introduced its first machine, the Cube, in 1988, it was incompatible with existing computers. These computers had virtually no software to run on them. Jobs urgently needed outside software developers to write programs for the Cube. He found the basis for his operating system in Carnegie Mellon University software called Mach, which happened to use object-oriented programming. Jobs' goal was not to ease programmers' lives; he just wanted to get some programs written and shrink-wrapped pronto so he could sell his NextStep computers. [Deutschman, 1993, p. 102]

NextStep squeezed its way into the field of being a good platform for companies to build object oriented programming through a review done by CKS Partners. CKS Partners is a San Francisco advertising agency founded by a bunch of old Apple colleagues. Jobs NextStep advertising agency needed help in promoting the NextStep, because it boasted about the computers hardware disk storage and processing chip technology, but gave no compelling reason for businesses to buy a NextStation. Jobs called on his old friends at CKS Partners to help his advertising agency out. CKS conducted focus groups of Fortune 500 managers in charge of information systems. They came up with the report there was little perception in the marketplace about NextStep. But important information came from a number of hard-core information systems geeks. They had discovered NextStep made it much easier and faster for companies' in-house programmers to customize software to handle important parts of their businesses. Rather than start from scratch, programmers using object oriented programming can do much of the job by looking in a library of preexisting software modules. [Deutschman, 1993, p. 102]

This was a good report to have about the qualities and benefits of using a NextStep computer, because if companies were to read analyst report on NextStep computers in a computer magazine. The companies could reduce the time in developing software packages by having a preexisting library full of code all ready written to handle specific operations. And NextStep provides an easy platform to create libraries, maintain, and integrate the code in a object oriented programming environment. The companies would see a solution to the problem of spending too much time and money in building software applications. Software developers could reduce their time in finding errors and maintaining its software, because object oriented design allows a nice encapsulated structure, information hiding, and communication between modules through messages.

A company O'Connor & Associates, a Chicago options and futures firm, claims its engineers can write a complex trading program in three months with NextStep versus over two years on a Sun workstation. Corporate managers who ventured into using NextStep computers told NextStep, "You guys have one of the best products ever, but you do not even know it and you're not trying to sell it to us." Jobs recalls

himself, "Companies came to us and said, "You're idiots, you just do not get it." Now that NextStep knew companies in the real world could solve problems faster with NextStep computers. NextStep needed to advertise better how their computer's performance and benefits could make companies more productive. So Next went to compare their system against their number one competitor Sun computer. The Company commissioned a study by management consultants Booz Allen & Hamilton that showed that corporate programmers worked two to nine times faster on NextStep machines, than on Suns and others. When Sun World magazine gave its highest rating not to a Sun machine but to the NextStation Turbo machine, a NextStep advertisement proclaimed: *NEXTSTEP CAST SHADOW OVER SUN.*

From the review reports the company's sales have gone up, but NextStep has been forced to turn to its Japanese partner for cash infusions. Canon originally invested \$100 million in 1989 and added another \$10 million to \$20 million in 1991 before extending that \$55 million credit line last July in 1992. Canon holds an 18% equity stake Industry analysts say that the Japanese are increasingly scrutinizing their investment. The heat is on for NextStep to start producing high marginal returns from selling their NextStep products. [Deutschman, 1993, p. 104]

Jobs thinks Next can survive as a software company when he attacks his old enemy Apple and IBM. He does not think the Apple-IBM linkup will work: "Apple has a thousand software engineers, who have realized that Taligent is their enemy." If apple adopts IBM's Taligent software, Jobs explains their out of a job. Instead, he argued, if Apple will stick with its System 8, under development in-house, leaving IBM as Taligent's primary advocate in the marketplace. This would leave IBM in a bad position. Jobs admits that Microsoft has "market power" and sees Cairo as his main competitor.

Jobs feels his NextStep machines are going to be in high demand, because once businesses figure out how to use object oriented programming to solve most of their design problems. Business are going to buy NextStep computers to run the object oriented platform, because the businesses have money and will pay big

money for things that will save them money or give them new capabilities.

[Goodell, 1994, p. 78]

Jobs thinks the advantages of NextStep software compared to its rival Microsoft is its ability to design programs in an object oriented design. Jobs perceives Microsoft Windows as a bad development environment. And Microsoft does not have any interest in making it better, because the fact that it's really hard to develop applications in Windows plays to Microsoft's advantage. Microsoft developed their software so companies cannot have small teams of programmers writing word processors and spreadsheets, because it might upset their competitive advantage.

Jobs states that NextStep will become the preferred platform for businesses to develop software. Therefore NextStep software will out compete Microsoft in programming languages used to develop applications. [Goodell, 1994, p. 78]

Jobs thinks object oriented programming will allow small company's to build libraries containing already built coded modules. These libraries will allow programmers to incorporate pre-existing modules to perform specific operations in their code. This type of programming technique will reduce time a programmer has to spend on writing code. Therefore less time spent on a project the company saves money. Since the library code has already been tested, programmers using the pre-existing code in their programs have fewer errors. Less errors to fix in a program means less time spent on the program which saves the company money.

Jobs says NextStep software will literally let three people in a small business out perform what 200 people at Microsoft can do. Corporate America has a need to find a solution to their problems. Jobs feels NextStep software can save companies a lot of much money or make them a lot much money. If companies do not presently invest into object oriented programming, their developing technique will cost them large amounts of money. Later, when they try to re-organized their software system they fuel the object revolution. [Goodell, 1994, p. 78]

Jobs believes Microsoft has not transformed itself into an agent for improving things or a company that will lead the next revolution in software development.

Jobs has become very concerned because he sees Microsoft competing very fiercely to put a lot of companies out of business. This is hurting innovation in the

computer industry. Jobs feels the computer industry needs an alternative to Microsoft's software in computer systems. He hopes people will turn to NextStep software. [Goodell, 1994, p. 78]

Steve Jobs

How did the creation of Apple and NextStep develop Steve Jobs's managing skills?

Jobs has been criticized as America's roughest, toughest, most intimidating bosses. Ever since Steve Jobs founded Apple Computer when he was 21, the meditating computer mogul was known as the terrible infant of Silicon Valley. Now, as head of NextStep, the 38-year-old Jobs is no longer an infant, but according to those who have worked with him, he still is terrible. [Dumaine, 1993, p. 40]

Many colleagues describe Jobs as a brilliant man who can be a great motivator and positively charming. At the same time his drive for perfection is so strong that employees who do not meet his demands are faced with blistering verbal attacks that can eventually burn out even the most motivated of people. Jobs pushed his workers to the heights of unethical work conditions. In the late 1980's, two NextStep engineers had been slaving nights and weekends for 15 months to meet an important and impossible deadline for a new state-of-the-art chip. No one had ever designed such a thing before, and the strain was incredible. At a weekend off-site meeting Jobs publicly and viciously berated them before the entire company for not working faster, even after all their effort they put into building the chip. Out of pride they finished the project, but one of them quit soon thereafter. A NextStep employee describes his attitude: "You've been on it a week, and you're supposed to be brilliant. So what have you done? That's why so many people are afraid of him." [Dumaine, 1993, p. 40]

Jobs's drive for perfection often lead him to be ignorant to other people's ideas. One ex-employee recalls how Jobs was demanding that, on principle, he would often reject anyone's work the first time it was shown to him. To cope with this unreasonableness, workers deliberately presented their worst work first, saving their best for a subsequent presentation, when it could have a better chance of

satisfying the boss's expectations. Several employees felt Jobs is going through a major personality change and becoming much more of a consensus manager and team player. [Dumaine, 1993, p. 41]

Steve Jobs, a college dropout who experimented with drugs and Eastern religions before turning to computer design was an unlikely candidate to have become the prototype of America's computer industry entrepreneur. The accomplishments Steve Jobs had on the computer industry while at Apple was introducing the personal computer. Jobs was bona fide visionary, who created the personal computer, Apple, in his garage. The Apple changed people's view on operations a computer could perform. From computers performing bean counter operations and federal taxes to executing individual's personal business operations. Jobs led a hardware revolution by reducing the size of computers to small boxes.

His development of the Macintosh re-introduced Xerox's innovative idea of user-friendly interface using a mouse. The Macintosh used a windows interface which contained picture-like icons representing a function or a program to be executed. The user would use a mouse to move a cursor onto the icon and press a mouse button to execute the function or program. Companies witness the success of the Macintosh's user-friendly interface and copied its style to develop their software. Jobs, in the nineties, will try to lead another revolution in software development for corporate developers to use the OOP paradigm to solve the massive time and money problems it takes to develop software.

References

- Conant, Jennet and Marbach, William, D. 1984. "It's the Apple of His Eye". *NewsWeek*, 30 (January): 54-57. Gelman, Eric and Rogers, Michael. 1985. "Showdown in Silicon Valley". *NewsWeek*, 30 (September): 46-50.
- Goodell, Jeff. 1994. "Eve Jobs". *Rolling Stone*, 16 (June): 73-79.
- Halliday, David. 1983. "Steve Paul Jobs". *Current Biography* 5 (February): 204-207.
- Morrison, Ann, M. 1984. "Apple Bites Back". *Fortune* 20 (February): 86-100.

Scott, Linda, M. 1984. "For the Rest of Us: a Reader-Oriented Interpretation of Apple's 1984 Commercial". *Journal of Popular Culture* (Summer): 71-78.

Sculley, John. 1987. "Odyssey". *Personal Computing*, (December): 201-209.

Uttal, Bro. 1985. "The Adventures of Steve Jobs". *Fortune*, 14 (October): 119-124.

Copyright Lee Angelelli, 1994. Last updated 94/12/07